

AmpXpress™



User Manual



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AlphaHelix Molecular Diagnostics AB
Kungsängsvägen 29
SE-753 23 Uppsala, Sweden

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5. QUESTIONS AND ANSWERS
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1. TECHNICAL DESCRIPTION

AmpXpress enables rapid temperature cycling while maintaining thermal homogeneity. The following modules contribute to this:

- A high-speed rotor system (7000 rpm) enabling SuperConvection.
- A powerful heating system using an IR radiator and a reflector.
- An efficient cooling system that uses high-speed rotation to create a wind-chill effect that efficiently cools the samples.
- A sophisticated in-tube temperature measurement system that measures sample temperature in real-time.

1.1 SUPERCONVECTION™

When a sample is heated, the temperature change is distributed throughout the sample by convection, caused by the difference in density between warm and cold parts. Convection is normally driven by the earth's gravitation ($1 \times g$). In a conventional PCR instrument, the force driving convection is $1 \times g$. In **AmpXpress** convection is driven by a centrifugal force of more than $3000 \times g$ where the centrifugal force acts upon the denser (i.e. colder) subset of a sample. The convective movements resulting from differences in densities between hot and cold parts of the liquid are greatly increased in **AmpXpress** and result in instant temperature homogenization throughout the sample.

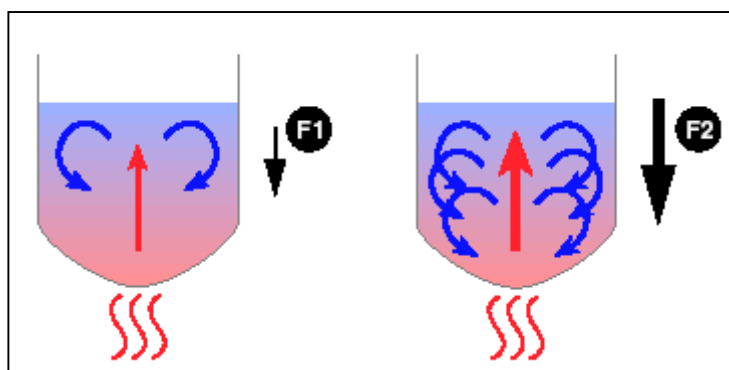


Figure 1 Principle of convection; effect of different driving forces (F1, F2).

1.1.1. Centrifugal force

A tube that is subjected to centrifugation is continuously accelerated towards the center of rotation. This is called centripetal acceleration. The acceleration depends on the rotation speed and the radius of the movement. The force acting on a tube subjected to centrifugation depends on the mass of the tube (including sample). This is the centripetal force, which is directed towards the center of rotation. The force that we experience when traveling around sharp bends in a car or train is called “centrifugal” force. The experienced force is actually the result of the centripetal force pulling the car or train towards the center of the curve. In your frame of reference, the seat is pressing you outwards, from the center of movement. This is also the case for a sample contained in a tube that rotates in a centrifuge. We therefore speak of the centrifugal force acting on the sample.

In **AmpXpress**, the centrifugal force induces SuperConvection (i.e. enforced convection), which ensures rapid and homogenous distribution of temperature changes within the reaction volume. This, in turn, enables rapid temperature ramping.

1.1.2. Rotational speed

The centripetal acceleration is determined by the rotational speed and the radius of the movement through a simple relation:

$$a_c = r(2\pi f)^2 \quad \text{where:} \quad (1)$$

a_c = acceleration
 r = radius of movement
 f = rotational frequency

For calculations, all three parameters must be measured in the same system of units, for example, SI-units m, s and Hz.

The centrifugal force (F_c) is, according to Newton's second law, directly proportional to the acceleration:

$$F_c = ma_c \quad \text{where:} \quad (2)$$

m = the mass of the sample

The centripetal acceleration is expressed in 'g', where $1 \times g$ equals the gravitation at the surface of the earth.

$$g = 9.81 \text{ m/s}^2$$

1.1.3. Example, typical rotational speed and centrifugal force

When describing a centrifuge we simply refer to the 'centrifugal force' expressed in ' $\times g$ '.

- The rotational frequency, or 'speed', is measured in rpm = revolutions per minute. This figure is divided by 60 to get the frequency in Hz.
- The calculated acceleration is divided by 9.81 for expression of centrifugal force in $\times g$.

The radius of the rotor in AmpXpress is 58 mm, from center of the rotor to the tip of the tube. As shown in expression (1), the centripetal acceleration is proportional to the square of the rotational frequency. A 10-fold increase in rotational speed results in a 100-fold increase in centrifugal force.

Rotational speed	Radius	Centrifugal force	Instrument
7000 rpm	58 mm	3100 x g	AmpXpress
400 rpm	65 mm	10 x g	Competitor A

Table 1. Centrifugal force for AmpXpress and a competing instrument.

1.2 AMPXPRESS

1.2.1 Rotor system

The rotor is driven by a powerful brushless DC motor mounted at the bottom of the instrument, operating at a variable rate between 4000 and 7000 rpm.

1.2.2 Heating system

The AmpXpress heating system comprises a circular, infrared (IR) radiator surrounded by a reflector. The IR radiator, together with the reflector, efficiently delivers infrared power that enables very rapid heat ramps. The size of the reaction chamber is minimized to maximize energy transfer, from the IR radiator to the samples.

1.2.3 Reflector

A heat resistant reflector is used to maximize the reflection of IR light from the IR radiator to the sample tubes.



Figure 2 Heating system. The circular IR radiator is surrounded by a reflector.

1.2.4 Cooling system

AmpXpress utilizes high-speed rotation to provide efficient cooling of the rotor system. The samples are cooled by an air flow drawn into the instrument. Warm air then exits through vents on the side and back panel. The reflector and the IR radiator are lifted during the cooling phase to maximize the cooling ‘wind-chill’ effect created by the high-speed rotation. The miniaturized size of the reaction chamber minimizes the volume that needs to be heated, which in turn favors a rapid cooling rate.

1.2.5 Sample capacity

Number of samples per run: 24 (full rotor).

Sample volumes: 20 µl, 50 µl and 100 µl.

2. AMPXPRESS INSTRUMENT MANUAL

AmpXpress is intended for research use only.

AmpXpress is only intended for amplification of genetic material.

AmpXpress performs rapid temperature cycling of PCR samples using SuperConvection™ technology. Elevated g-forces generated by a high-speed centrifuge, together with a powerful heating system, ensure instant thermal equilibration within the samples.

The PCR run is programmed using the buttons on the instrument or, optionally, using the AmpX software and an external PC. The temperature is monitored during the run and displayed in real-time on the display. A rapid 40-cycle PCR typically takes 20 minutes.

2.1. IMPORTANT NOTICE!

Use of any tubes other than recommended by AlphaHelix may damage the instrument. Failure to follow this recommendation will void all warranty.

Tubes recommended by AlphaHelix Molecular Diagnostics AB have been tested to withstand the elevated g-forces. Recommended 0.2 ml sample tubes need to be used together with AmpXpress to ensure proper and trouble free operation of the instrument. AlphaHelix 0.2 ml tubes (Product No: 61-0001 and 61-0003) has been tested to withstand the elevated g-forces, thereby ensuring trouble-free operation in AmpXpress. A special rotor also needs to be used with the instrument. These items are available from AlphaHelix Molecular Diagnostics AB, see Contact information.

2.2. SAFETY INFORMATION

Important!

Before using AmpXpress, it is very important to read and understand the complete 'AmpXpress User Manual'. Negligence may increase the risk for instrument failure and/or personal injury. To avoid any risk of injury, AmpXpress should only be operated by properly trained personnel and always in accordance with the instructions of this manual.

2.2.1. Safety symbols

The following safety labels are attached to the AmpXpress instrument. All users must read and understand the warnings before using the instrument.




Label	Position	Description
	Inside instrument cover	Indicates potentially hot parts.
	Rear panel	No user serviceable parts inside. Do not open covers. Read the User Manual before operating AmpXpress. Non-compliance with instructions may cause damage to the instrument.
	Under the instrument, on product label (see Figure 3)	Consult the AmpXpress User Manual.

Table 2. Safety labels on the AmpXpress instrument.

2.2.2. Safety notices

WARNING!

The '**Warning**' notice is used for an instruction that must be followed in detail in order to avoid personal injury. Users should not proceed until they clearly understand the instructions and all stated conditions are met.

CAUTION!

The '**Caution**' notice is used for an instruction that must be followed in detail in order to avoid damage to the product or other equipment. Users should not proceed until they clearly understand the instructions and all stated conditions are met.

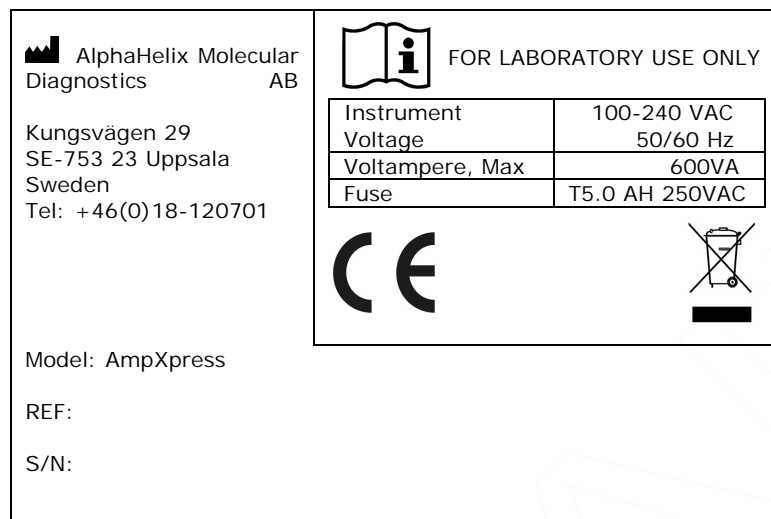


Figure 3 AmpXpress product label located under the instrument.

The '**Note**' symbol is used to indicate information that is important for trouble-free or optimal use of the product.

2.2.3. Safety precautions

WARNING!

Before using the product make sure the proper fuse is installed according to the instructions found on the product label located on the bottom of the instrument (see Figure 3).

WARNING!

AmpXpress must always be connected to a grounded mains outlet, rated minimum 5 A, using the power cord delivered with the instrument. Do not use any other power cord.

WARNING!

Keep a safety distance of at least 30 cm from AmpXpress during operation.

WARNING!

Do not deposit any potentially hazardous materials within 30 cm from AmpXpress.

WARNING!

The product must never be moved during operation.

WARNING!

The product must never be used close to water baths or flooding water.

WARNING!

Do not open the cover panels. Some parts inside the instrument have high voltages capable of causing injury or death. Refer servicing to personnel authorized by AlphaHelix Molecular Diagnostics AB.

**WARNING!**

For continued protection against risk of fire, ensure that any replacement fuses are of the specified type and current rating. Always disconnect the power cord before carrying out any service task.

**WARNING!**

AmpXpress does not have a 'bioseal'. Therefore, materials used with it must not be toxic, radioactive, or contaminated with pathogenic microorganisms (according to IEC/EN 61010-2-020).

CAUTION!

Always use counterweights, i.e. tubes filled with the appropriate volume of water, to fill up all empty positions in the sample tray.

Note: The PCR process is extremely sensitive to contamination. Always wear protective clothing when handling reagents, samples, and amplified material.

2.2.4. Grounding and electrical safety

AmpXpress must be grounded for protection against electrical shock.

2.2.5. Safety mechanism

Hardware interlocks ensure that the user can only open the instrument lid once the rotor has come to a complete stop. No moving parts can be accessed without opening the lid.

Condition	Interlock function
Rotor is turning	Lid opening is disabled by a hardware relay, which is controlled by speed sensing electronics.
Power interrupted by disconnecting the power cord	Lid opening is disabled mechanically. Opening the lid requires the power to be restored or manually unlocking the lid locking mechanism (accessible via a hole on the left side) using a 1 mm screwdriver (see 0).

Table 3. Interlock conditions preventing opening of the instrument lid.

2.2.6. Emergency shutdown

In a situation with risk of personal injury, stop AmpXpress as quickly as possible by unplugging the power cord.

2.2.7. Power failure

In the event of a power failure, the rotor will slow down and come to a complete stop. The PCR process is thereby interrupted. The instrument lid remains locked until power is restored.

2.2.7.1 Main after power failure

Make sure that the rotor has come to a complete stop. The instrument lid can be opened once power has been restored.

2.2.8. Alarms

2.2.8.1 Buzzer

A buzzer sounding for 5 seconds with 20 second intervals indicates that the run has ended. The signal keeps sounding until the message is cleared by pressing any of the five control buttons on the front panel of the instrument. Another, more intense buzz, with a higher pitch is activated in the case of an instrument error and sounds for 10 seconds with 20 second intervals.

2.2.8.2 Warning LED

When there is an instrument error, that causes the instrument to terminate a run, the red 'Warning LED' will be lighted together with an error message showing up on the screen. Consult the manual for detailed information regarding the nature and cause of the error (see chapter 6. Error messages).

2.3. UNPACKING AND INSTALLING AMPXPRESS

Unpack and install the AmpXpress instrument according to the 'Unpacking and installation instructions' provided with the instrument.

2.3.1 Inspect AmpXpress

Inspect AmpXpress and its supplied parts for any damage that might have occurred during shipment.

If AmpXpress appears to have been damaged during transit, report such damage to the carrier and AlphaHelix within one week from receipt of the instrument.

2.3.2 Physical requirements

Place the instrument on a workbench that is stable enough to take the weight of the instrument, as well as any instrument vibrations. Allow 30 cm of clearance on all sides of the instrument. Make sure there is sufficient room to allow the instrument lid to be fully opened.

Note: Do not block air vents. Allow 30 cm of clearance on all sides of the instrument.

CAUTION!

Neglecting the importance of an adequately stable bench/table may cause serious damage to the instrument, in the event that the bench/table should collapse.



WARNING!

To prevent the instrument from moving (sliding) AmpXpress must never be installed close to where water is being used.

CAUTION!

It is important that the instrument is placed on a horizontal bench/table. Make sure that the bench/table is correctly leveled using a spirit level.

CAUTION!

Not allowing enough ventilation space around the instrument, or in any way obstructing or restricting the ventilation, may cause the instrument to work under sub-optimal conditions, or, in the worst case, to overheat and shut down.

2.3.3 Electrical requirements

AmpXpress must be connected to a grounded power outlet rated according to the product label located on the bottom of the instrument (Figure 3). Importantly, only ever use the power cord delivered with the instrument.

CAUTION!

Do not extend the power cord, or in any other way alter the power cord, as this might result in blow-out of fuses.

2.4. OPERATING THE INSTRUMENT

2.4.1 Operating conditions

AmpXpress will meet performance specifications when the ambient temperature is 15 to 25°C and the relative humidity is within RH 50-80 %.

2.4.2 Samples and tubes

The instrument is intended for PCR analysis of RNA and DNA samples. Always use AlphaHelix 0.2 ml tubes (Product No: 61-0001 or 61-0003) to ensure trouble free operation.

CAUTION!

Use of any tubes other than AlphaHelix 0.2 ml tubes (Product No: 61-0001 or 61-0003) will potentially damage the instrument. Failure to follow this recommendation will void all warranty.

CAUTION!

Always secure the rotor using the rotor locking screw to prevent damage to the instrument.

CAUTION!

Do not use any other rotors than the one supplied with the instrument from AlphaHelix (Product No: 60-0005).

⚠ WARNING!

Do not centrifuge any flammable or explosive mater or any material that could react chemically with sufficient vigor to cause a hazard.

2.4.3 User interface

The instrument is controlled, and programs are created, using the five buttons on the front panel of the instrument. Run parameters may also be set and loaded to the instrument using the AmpX Software installed on an external PC (see section 4, 'AmpX Software Manual').

The Display is lit when the power cord on the back of the instrument is plugged into a power outlet. The Warning LED is lit if there is an instrument error that causes termination of a run (see 6. Error messages).

2.4.4 How to open the lid

The lid is opened by pressing the 'up' arrow control button followed by 'OK'.

In a situation where lid opening, via the control buttons, is disabled the lid may be opened manually.

Always disconnect the mains power cord before following the below instruction, failure to disconnect the mains power cord may result in damages of the locking mechanism!

Insert a small (1 mm) screw driver into the hole located on the left hand side of the instrument (0). Inserting the screwdriver will unlock the lid locking mechanism. Grab the instrument lid to fully open the lid and to access the rotor (Figure 5).



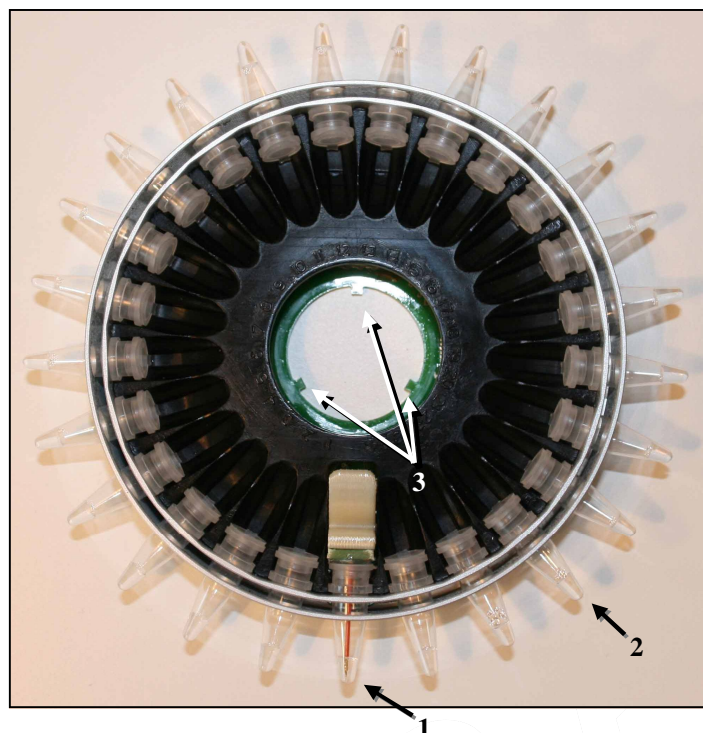
Figure 4 Insert a small (1 mm) screw driver into the hole to manually open the lid.



Figure 5 Grab the instrument lid to fully open it.

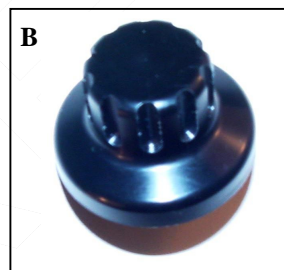
2.4.5 The rotor

The rotor (Figure 6A) is detachable and allows the user to load samples outside of the instrument. Once the rotor has been fully loaded, it is positioned in the instrument using the guide pins (Figure 6A) and fastened using the rotor locking screw (Figure 6B).



A. The rotor.

1. Liquid temperature probe.
2. Sample tubes.
3. Guide pins



B. Rotor locking screw.

Figure 6 A. The 24-sample rotor showing the position of the temperature probe. B. The rotor locking screw.

2.4.6 The temperature probes

In a rapid instrument, such as AmpXpress, it is important to accurately measure and control the temperature to avoid over or undershooting of sample temperature. In AmpXpress, this is achieved using a temperature probe (thermistor) placed inside a sample tube, which is positioned in the rotor to mimic a real sample. This enables exact control of actual sample temperature in real-time throughout the run, contrary to other systems that rely solely on measuring the temperature of a metal block, or air surrounding the samples. Another advantage of the temperature probe is that it ensures that every individual run is temperature controlled.

The temperature probe fits into a dedicated slot on the rotor, from where it is easily removed and re-inserted when the probe needs to be refilled. Probes are built for, and calibrated with, 20, 50, or 100 μ L of distilled or demineralized water (See figure 8). 20 μ L probes are labeled '20 μ L', 50 μ L probes are labeled '50 μ L', and 100 μ L probes are labeled '100 μ L'.

Note: Always use a '20 μ L' probe for 20 μ L samples, a '50 μ L' probe for 50 μ L samples, and a '100 μ L' probe for 100 μ L samples. **If a 100 μ L probe is accidentally used together with 20 μ L samples, sample tubes may burst from the intense heat.**

Note: In order to run 25 μ L PCR reactions, simply fill up the 20 μ L probe to 25 μ L of distilled or demineralized water.

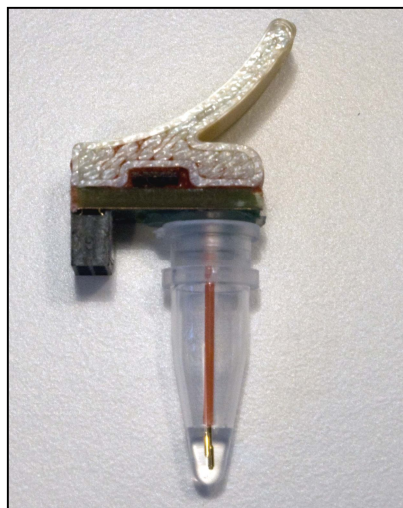


Figure 7 The temperature probe.

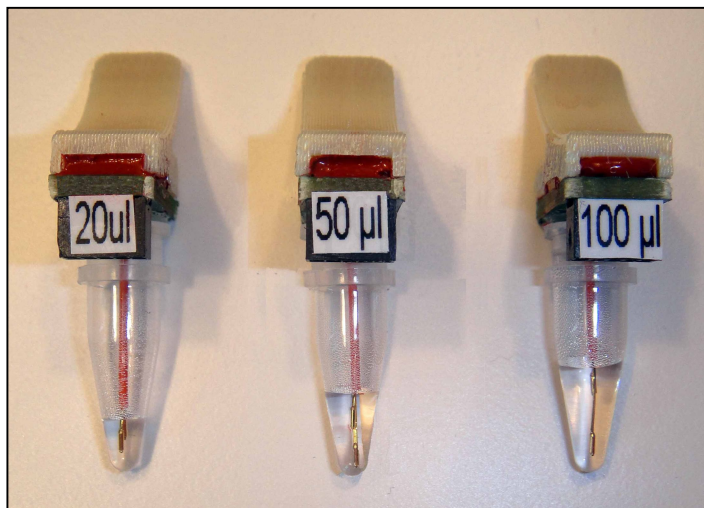


Figure 8 20, 50 and 100 μ l probes are available and should be used for corresponding PCR reaction volumes.

Since the liquid volume tends to decrease over time, due to evaporation, it is important to check the liquid volume of the temperature probe prior to each run. Check the amount of liquid in the probe tube visually using the level measuring stick, or alternatively using a balance (i.e. weigh the temperature probe). Both thermistors should be submerged. If they are not, the water level is too low. In this situation, refill the probe using distilled water to the appropriate level: 20, 50, or 100 μ L. Handle the probe very gently when opening and closing to avoid damage to the gold-plated thermistors. If the thermistors become bent, realign them very gently using gloved hands.

CAUTION!

All probes are delicate and fragile and must be treated with utmost care. Do not, under any circumstances, tamper with or modify the probes since this would negatively affect the control of the instrument, thereby affecting the outcome of the PCR, and may also damage the instrument.

Note: When not in use, temperature probes should be stored in a refrigerator, @ +4°C, to minimize evaporation of the liquid.

2.4.7 Loading samples

2.4.7.1 Loading samples into the rotor

1. Position the hinge of the tubes downwards, facing the rotor, with the opening flange pointing upwards. The positions of the rotor are labeled '1' to '24'.
2. Fill up all empty spaces with dummies (i.e. tubes with water containing the same volume as the sample tubes).

Note: Make sure that the tubes are correctly and uniformly placed in the rotor by grabbing each tube one by one (using gloved hands) and pulling them outwards.

2.4.7.2 Positioning the rotor in the instrument

1. Place the rotor onto the rotor axis. The rotor has three guide pins to correctly orientate the rotor, which in turn has guide slots that fit the guide pins (Figure 6).
2. Tighten the locking screw and close the instrument lid.

Note: Do not use excessive force when tightening the locking screw as this might make it difficult to loosen the screw after the run has completed.

2.4.8 Buzzer

A buzzer, sounding for 5 seconds with 20 second intervals, indicates that the run has ended. The buzzer keeps sounding until the message is cleared by pressing any of the five control buttons on the front panel of the instrument. Another more intense buzz, with a higher pitch, is activated in the case of an instrument error and sounds for 10 seconds with 20 second intervals.

2.5. PERIODICAL MAINTENANCE

2.5.1 Temperature probes

For proper function of the instrument it is important to visually check the water level of the temperature probe before each run. Both gold-plated thermistors should be submerged. If not, the water level is too low. In this situation, refill the probe using distilled water. Handle the probe very gently when opening and closing to avoid damage to the gold-plated thermistors. If the thermistors become bent, realign them very gently using gloved hands. Probes are fitted with a handle to facilitate handling.

Note: If there is not enough water to cover both gold plate thermistors temperature regulation will not work properly and may cause the instrument to shut down and terminate the run.

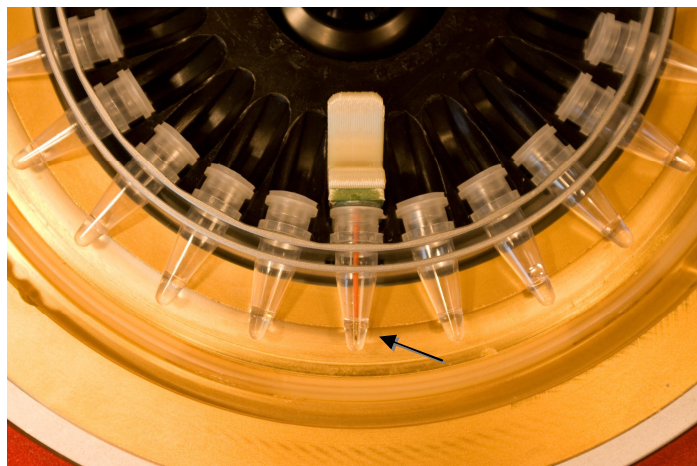


Figure 9 Visually inspect the position of the thermistors to make sure they are placed in the middle of the tube, and are not in contact with tube walls. If thermistors are out of position, remove the tube (see 2.5.2) and realign thermistors gently using gloved hands.



Figure 10 Visually inspect the water level of the temperature probe prior to each run, using the level measuring stick provided with the instrument. Both gold-plated thermistors should be submerged. If they are not, refill the probe with distilled water (see below)

2.5.2 How to refill the temperature probe



Figure 11 Detach the probe by grabbing the handle and gently pulling it towards the rotor axis.

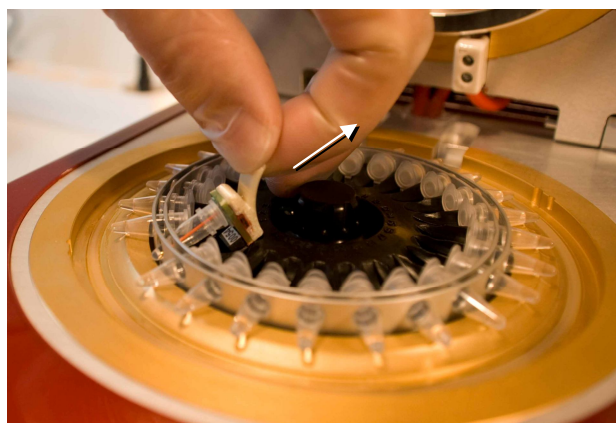


Figure 12 Slide the probe towards the rotor axis and lift it to get it out of the rotor.

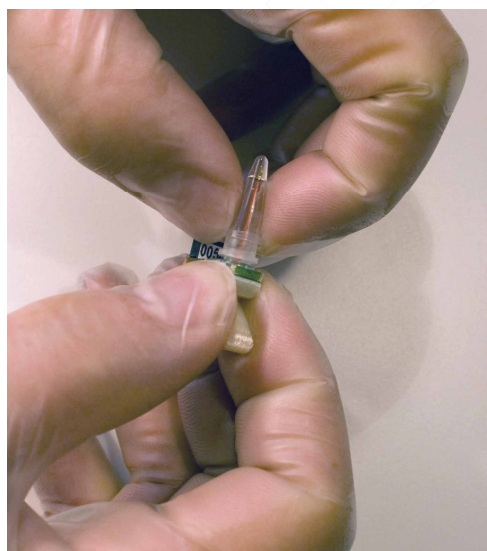


Figure 13 Grab the upper part of the probe (the handle) with one hand and the plastic tube with the other.

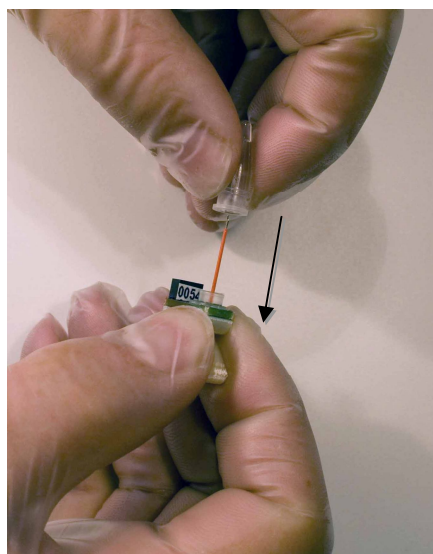
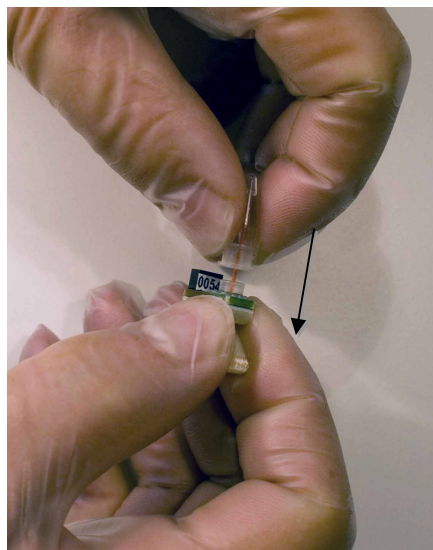


Figure 14 Separate the upper and lower part of the probe. Refill the tube with 20 appropriate volume of distilled water.

2.5.3 How to assemble the temperature probe

Assemble and install the probe in the reverse order (see Figure 11 to Figure 14). To ensure proper contact and alignment of the probe, gently push the probe outwards so that the tube rests properly against the edging of the rotor.

2.5.4 Changing the external fuses



WARNING!

For continued protection against the risk of fire, replace fuses only with the same type and rating as those currently installed in the instrument ('T5A H 250V', see Figure 3).

2.5.5 Inspect for damages

Inspect the rotor, protective lid and centrifuge axis for any damages on a weekly basis.

2.5.6 Contact surfaces of the rotor

Clean the electrical contact surfaces underneath the rotor using a damp cloth before use (see Figure 15).

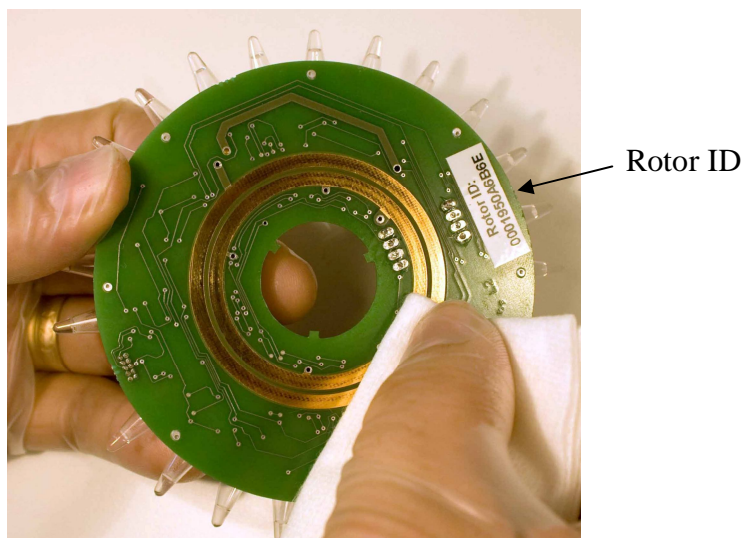


Figure 15 Clean the electrical contact surfaces underneath the rotor using a damp cloth, moistened with isopropanol.

2.5.7 Cleaning the instrument

The instrument is cleaned using a damp cloth or sponge and a mild detergent/water solution. Blot dry.

Note: Before using other cleaning or decontamination methods than those recommended in this user manual, user should check with AlphaHelix or distributor that the method will not damage the equipment.

2.5.8 Decontaminating the instrument

In the event of tube breakage and amplicon contamination, decontaminate the interior of the instrument using DNA-ExitusPlus™ from AppliChem (www.applichem.com). Apply DNA-ExitusPlus to a paper towel and wipe all surfaces of the instrument that may have come into contact with the sample. The cleaned parts should be subsequently wiped with a paper towel moistened with water and then allowed to air dry.

Before use of any other decontamination method, please contact AlphaHelix.

N.B. If hazardous material is spilt onto or inside AmpXpress, the user has the responsibility for carrying out appropriate decontamination.

2.6. SPECIFICATIONS

Mains voltage: 100 – 240 VAC, 50-60 Hz, Maximum: 600 VA

Equipment class: Class 1 equipment

Enclosure safety class: IP 20

Sample capacity: 24 samples

Sample volumes: 20 µl, 50 µl and 100 µl

PCR cycle time: Typically below 20 min when performing 40 cycles (20 µl samples)

Operating temperature: 4 – 32 °C

Performance measured at: 20 °C

Operating humidity to meet performance: RH 50 – 80 %

Weight: Approx 8 kg

Dimensions (WxDxH): 19 x 35 x 15.5 cm

Maximum noise level: 70 dB

Connection to Personal Computer: USB 2.0 (USB to Serial driver on host computer)

3. AMPXPRESS USER INTERFACE MANUAL

3.1. INTRODUCTION

The five control buttons on the **AmpXpress** front panel (Figure 16), are used to program the instrument. , i.e. to enter run parameters user interface is made up of a simple entry-level menu structure (Figure 17) and basic control buttons The 'left' and 'right' arrows are used for to toggle between the different menus.



Figure 16 Control buttons and Warning LED.

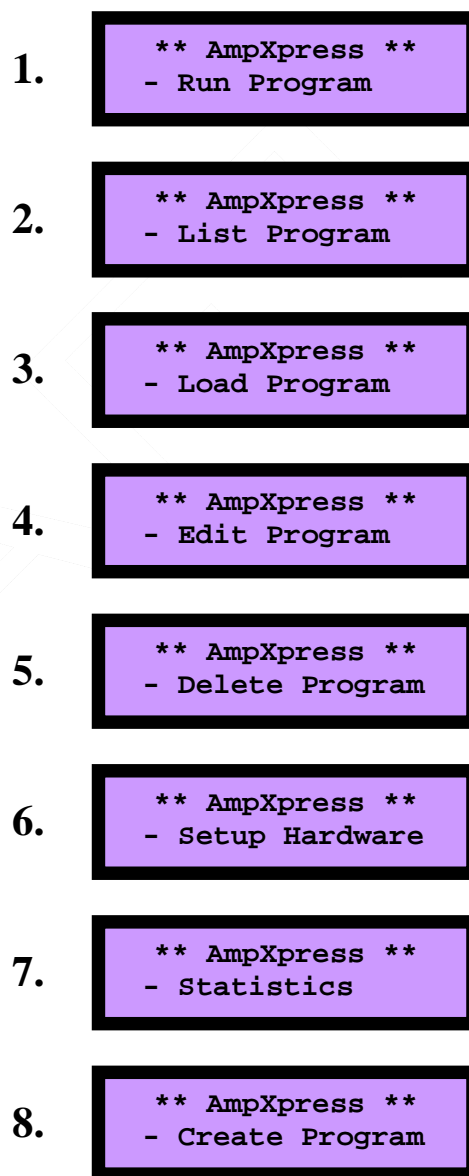


Figure 17 AmpXpress user interface menu.

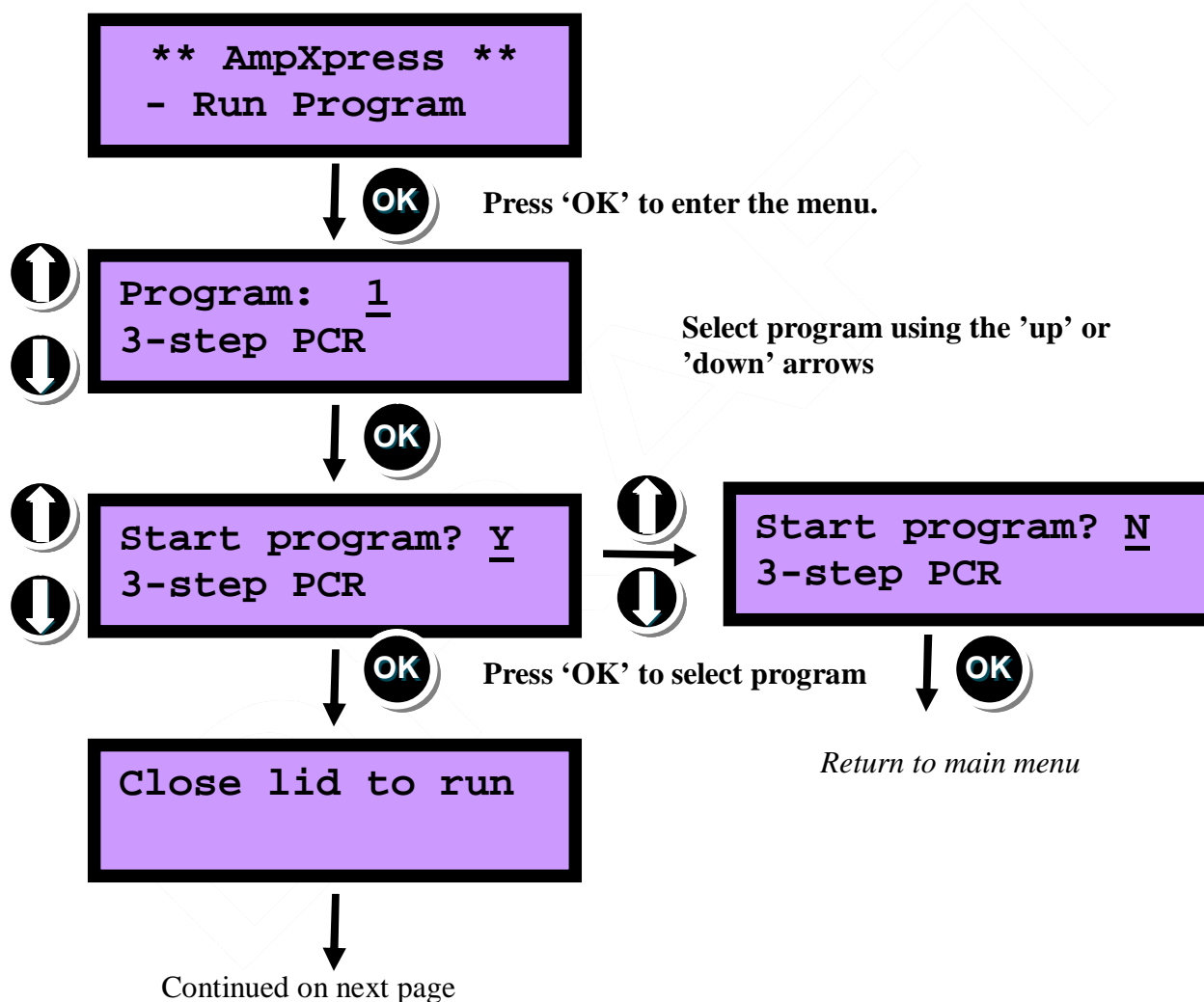
3.2. DESCRIPTION OF PROGRAMMING (RUN) PARAMETERS

When creating a program, time and temperature values are defined plus the number of cycles, and when applicable, also touch-down settings.

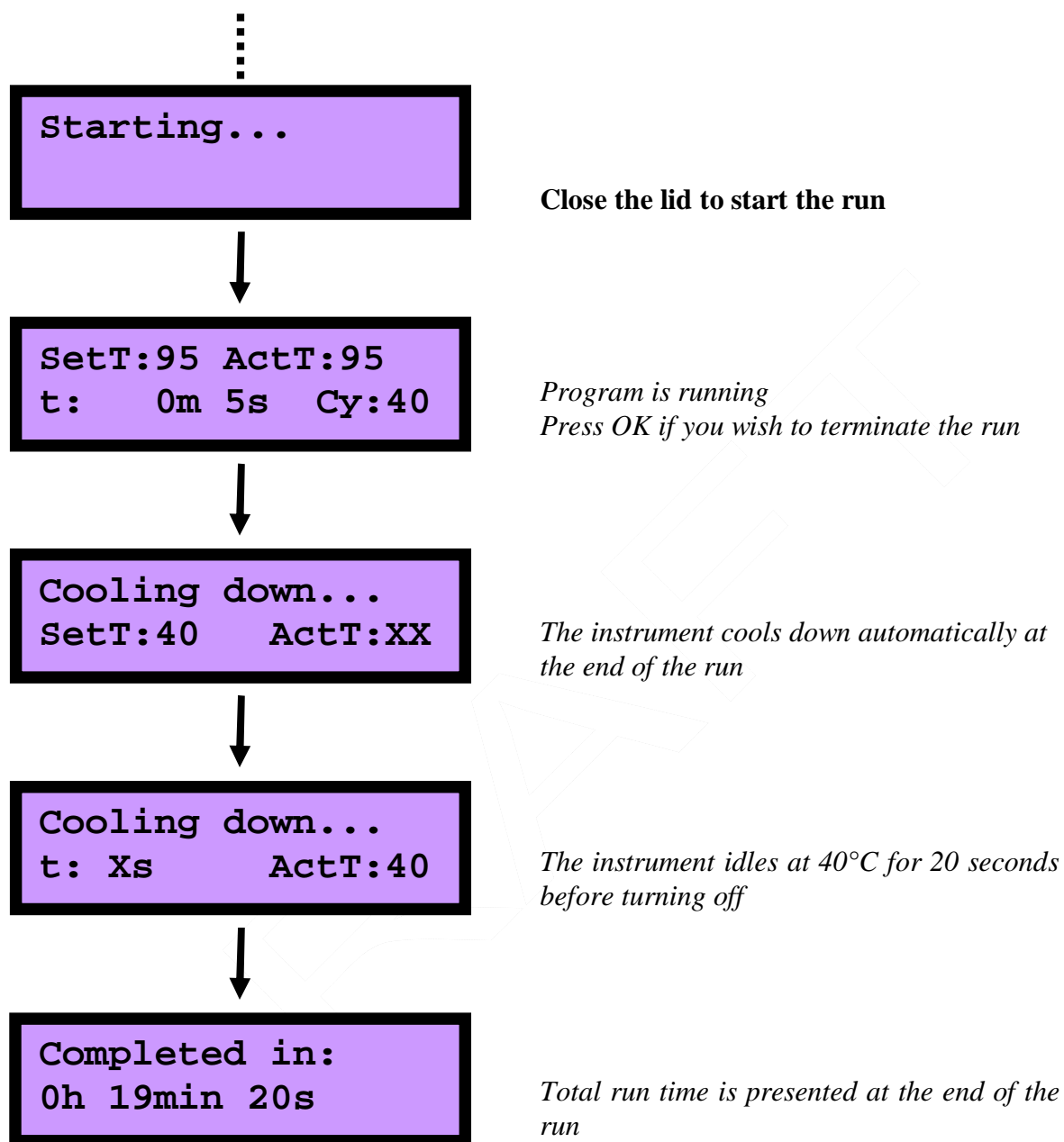
Time is defined in two consecutive windows, first minutes and then seconds (see page 35, section 3.10).

3.3. RUN PROGRAM

The 'Run program' menu is used to select which program to run among the programs that are stored internally in AmpXpress. Press 'OK' to enter the menu and then the 'up' or 'down' arrows to toggle between the different programs.

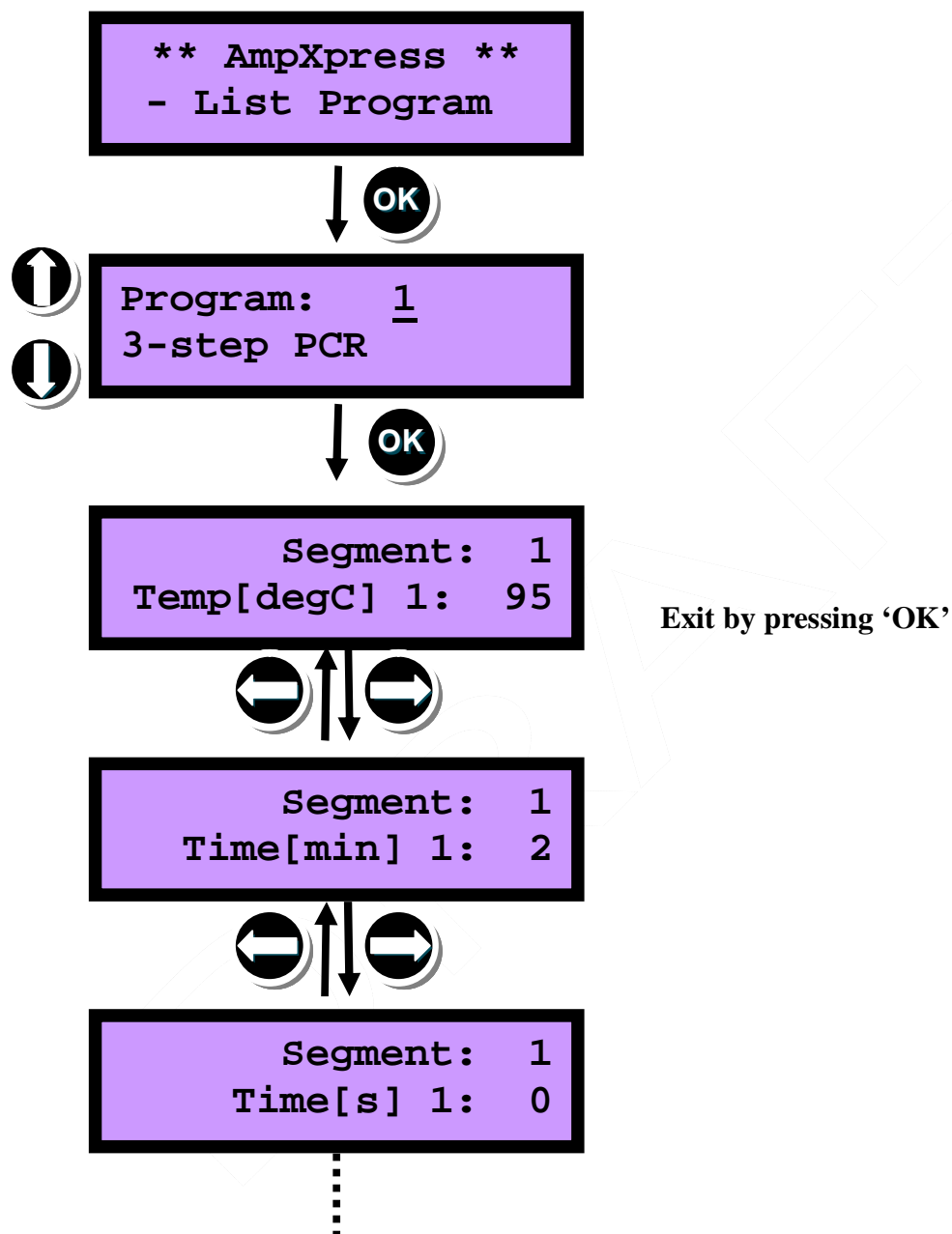


Continued from previous page



3.4. LIST PROGRAM

The 'List program' function is for *viewing* program settings only. Enter the menu by pressing 'OK'. Then use the 'left' and 'right' arrows to select which program to view (among programs stored in AmpXpress). Press 'OK' to select program and then use the 'left' and 'right' arrows to view program settings. Exit by pressing 'OK'.



3.5. LOAD PROGRAM

The 'Load program' function is used when sending programs from an external PC to AmpXpress. Press 'OK' to activate the USB port (located on the back of AmpXpress) so that it may receive programs from the external PC. Then press the 'Load' button from within the AmpX software (on external PC, see section 4.3).

**** AmpXpress ****
- Load Program



Send one program
'OK' to abort

Press the "Load" button on the external PC screen, within the AmpX software



Load succeeded

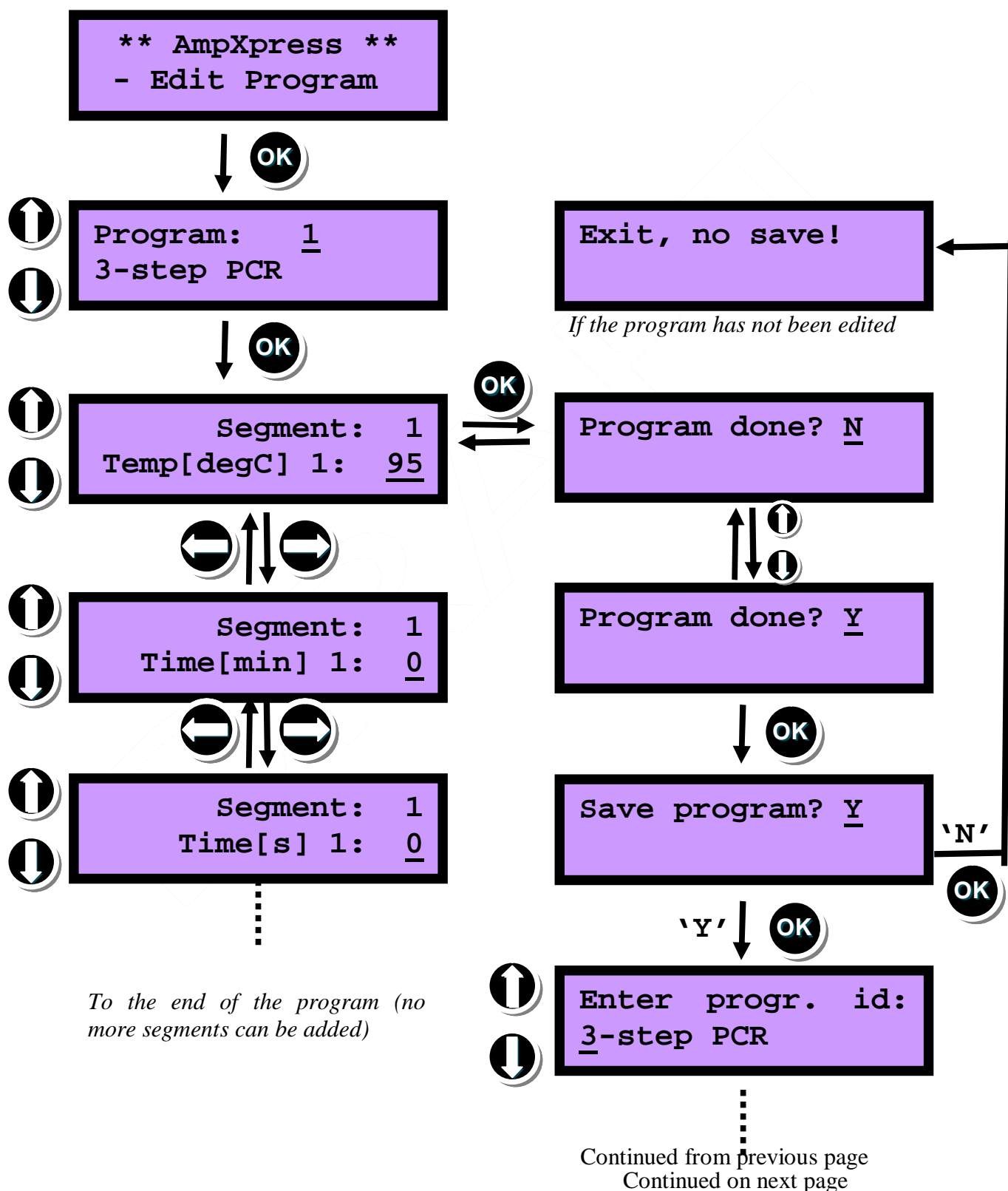
If the upload is not completed in 1 min, the following error message appears:

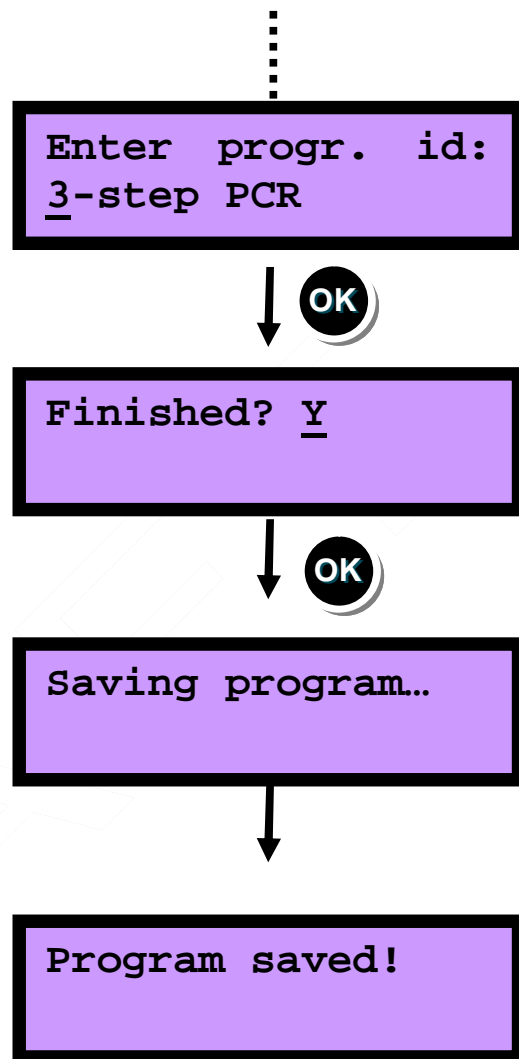
Load failed
Timeout

Exit by pressing 'OK'

3.6. EDIT PROGRAM

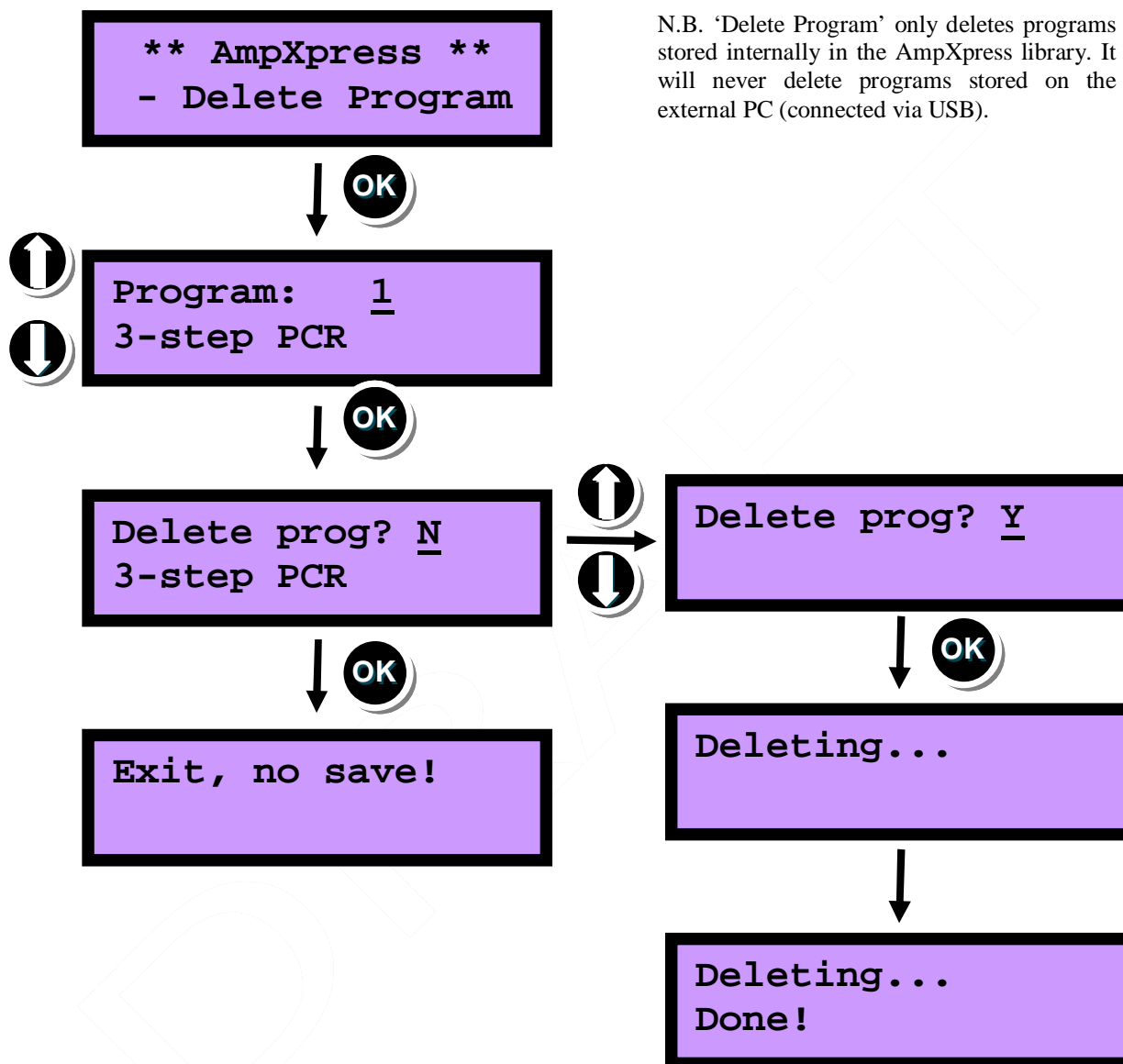
The 'Edit program' function is for *editing* program settings. Press 'OK' to enter the menu. Then use the 'up' and 'down' arrows to select which program to edit (among programs stored internally in AmpXpress). Press 'OK' to select program and then use the 'left' and 'right' arrows to toggle between the program settings. Edit settings using the 'up' and 'down' arrows. Exit by pressing 'OK'.





3.7. DELETE PROGRAM

The 'Delete program' function is for *deleting* programs. Press 'OK' to enter the menu. Then use the 'up' and 'down' arrows to select which program to delete (among programs stored internally in AmpXpress). Press 'OK' to delete and then use 'up' or 'down' arrow to select 'Y' to confirm. Finish by pressing 'OK'.




3.8. SETUP HARDWARE

The 'Setup Hardware' menu covers the following:

- **Firmware version** (presents the currently installed firmware version prior service call).
- **Select Rotor** (rotor ID).
- **Setup buzzer** (turn buzzer ON/OFF).
- **Ambient overtemp continue** (ambient over temp shut down/shut down override).
- **Reinit BT chip** (re-initialization of the Bluetooth chip).
- **Clear memory** (deletes **all** programs stored internally in AmpXpress).
- **Test valve** (test valve functionality, prior service call)
- **Test Lid** (test lid functionality, prior service call)
- **Test Fan** (Set the internal fan on/off, prior service call)

3.8.1 Firmware version

Displays the currently installed firmware version.



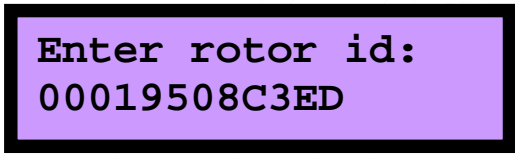
Firmware version
Press OK to show

SW 1.10: Internal instrument Release version
Build 445412: Internal instrument build version.

3.8.2 Select Rotor

Each rotor has a unique identification number. Do the following in case the rotor has been changed:

1. Choose "Select Rotor".
2. Check the rotor id shown on the display and the id number found underneath the rotor (Figure 15).
3. Edit the rotor id, using the control buttons, so that it agrees with the id number found underneath the rotor.




Enter rotor id:
00019508C3ED

3.8.3 Setup buzzer

Allow to turn On/Off the instruments buzzer. Turn the run-ready signal On/Off. Press OK key to acknowledge choice.

Note that no warning signals will be heard when buzzer is turned off!



Setup buzzer:
ON

3.8.4 Ambient overtemp continue

A too high ambient temperature (room temperature) negatively affects the performance of the instrument. If the temperature is higher than 32°C the instrument will not perform according to its specifications. Therefore, the instrument is programmed to notify the user in such case, either by a message only, or by shutting down the instrument. The 'Ambient overtemp continue' function allows the user to select the desired response, by allowing the instrument to 1) continue despite a too high ambient temperature ('ON'), or 2) shut down ('OFF').



Ambient overtemp
continue: ON

The following message appears in case the ambient temperature instrument is higher than 32°C:

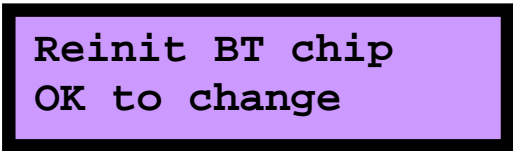


Overtemp!
OK to resume

Note: If the 'Ambient overtemp continue' is set to 'OFF' the instrument will shut down automatically.

3.8.5 Reinit BT chip


This function is used to reinitialize the Blue tooth communication circuit in the instrument. Should normally only be used after service.



Reinit BT chip
OK to change

3.8.6 Clear memory


Selecting 'Clear memory' (by pressing 'OK') will delete all programs stored internally in AmpXpress.



Clear memory
OK to change

3.8.7 Test valve

Select 'Test valve' (by pressing 'OK') and use the up and down keys to test the valve functionality.



Test Valve
OK to select



Up arrow = Valve OPEN

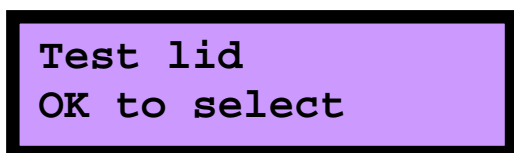


Down arrow = Valve CLOSED

Depending on the valve position when entering the valve test the other key needs to be pressed before the valve reacts. This is normal! Leave the menu with OK –key.

3.8.8 Test Lid

Select ‘Test lid’ (by pressing ‘OK’) and use the up and down keys to test the lid functionality.



Up arrow = lid OPEN



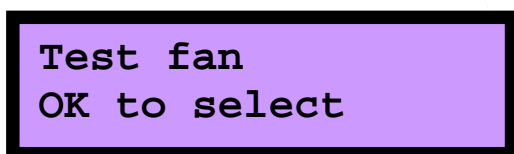
Down arrow = lid CLOSED

Depending on the lid position when entering the lid test the other key needs to be pressed before the lid reacts. This is normal!

Leave the menu with OK –key. Lid will be set OPEN when leaving the menu

3.8.9 Test fan

Select ‘Test fan’ (by pressing ‘OK’) and use the up and down keys to test the fan functionality.



Up arrow = fan ON

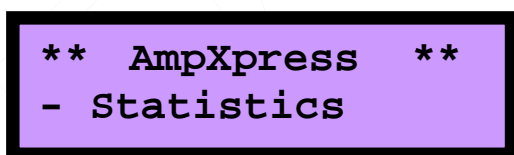


Down arrow = fan OFF

Leave the menu with OK –key. Fan will be set OFF when leaving the menu.

3.9. STATISTICS

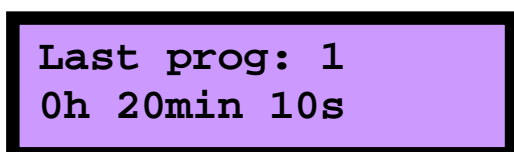
Select ‘Statistics’ to enter the statistics views



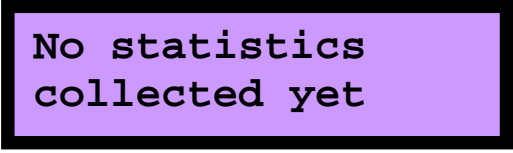
Statistics menus can be viewed by pressing right and left arrows. Press OK –key to leave the statistics menus.

3.9.1 Last program runtime

Show the program name and total run time of the last run.



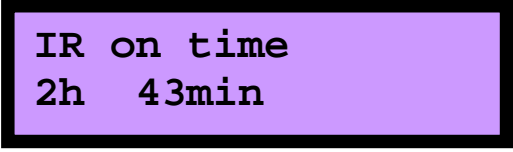
Note: The instrument only save the run time from the latest run. The information cannot be viewed after power down. If the menu is selected directly after the instrument is powered up the following display will be shown.



**No statistics
collected yet**

3.9.2 IR On time

The display shows the total on time of the IR heater.



**IR on time
2h 43min**

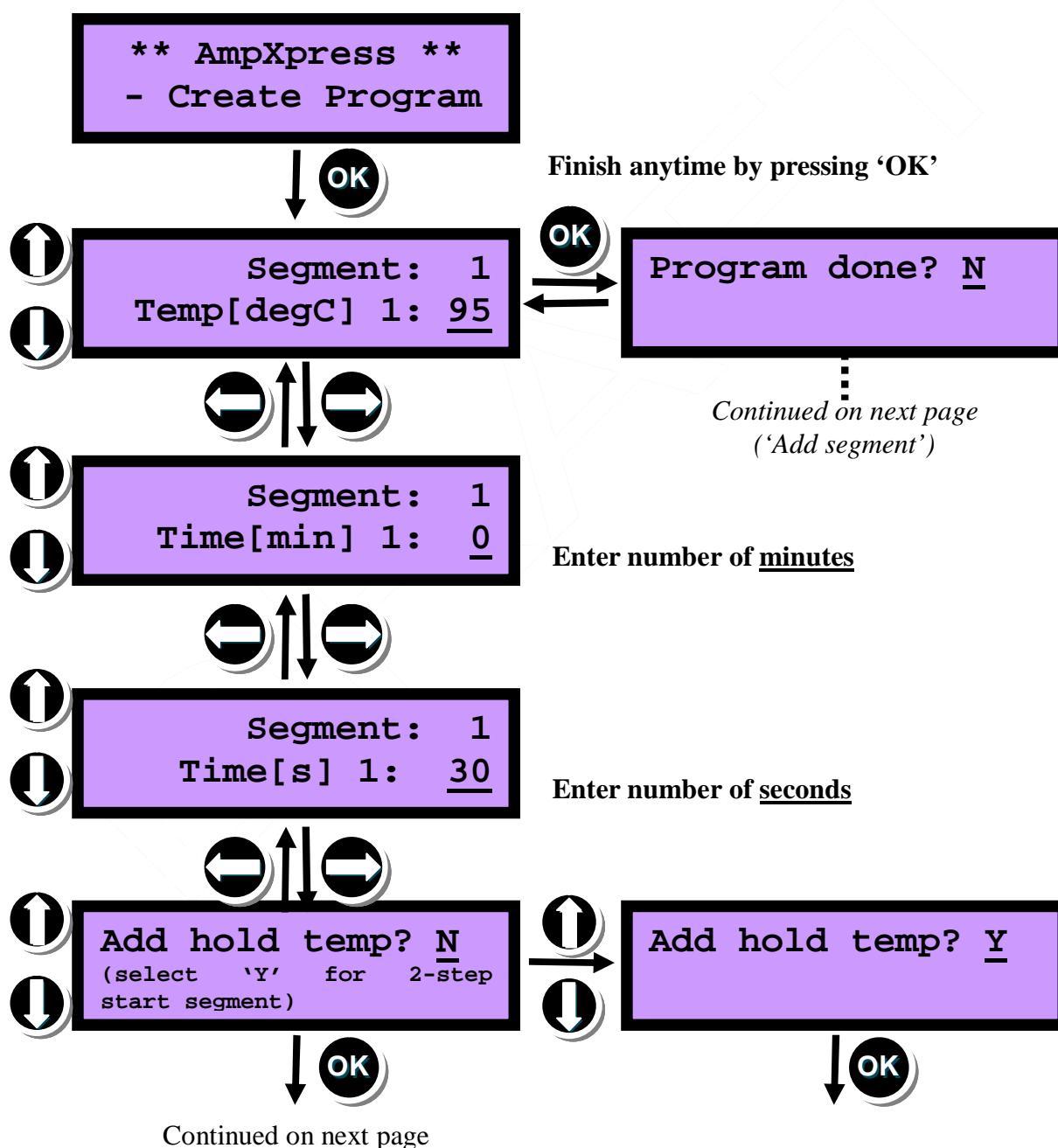
Note that the time does not match the running time of a program but the time a current is flowing through the IR radiator.

3.10. CREATE PROGRAM

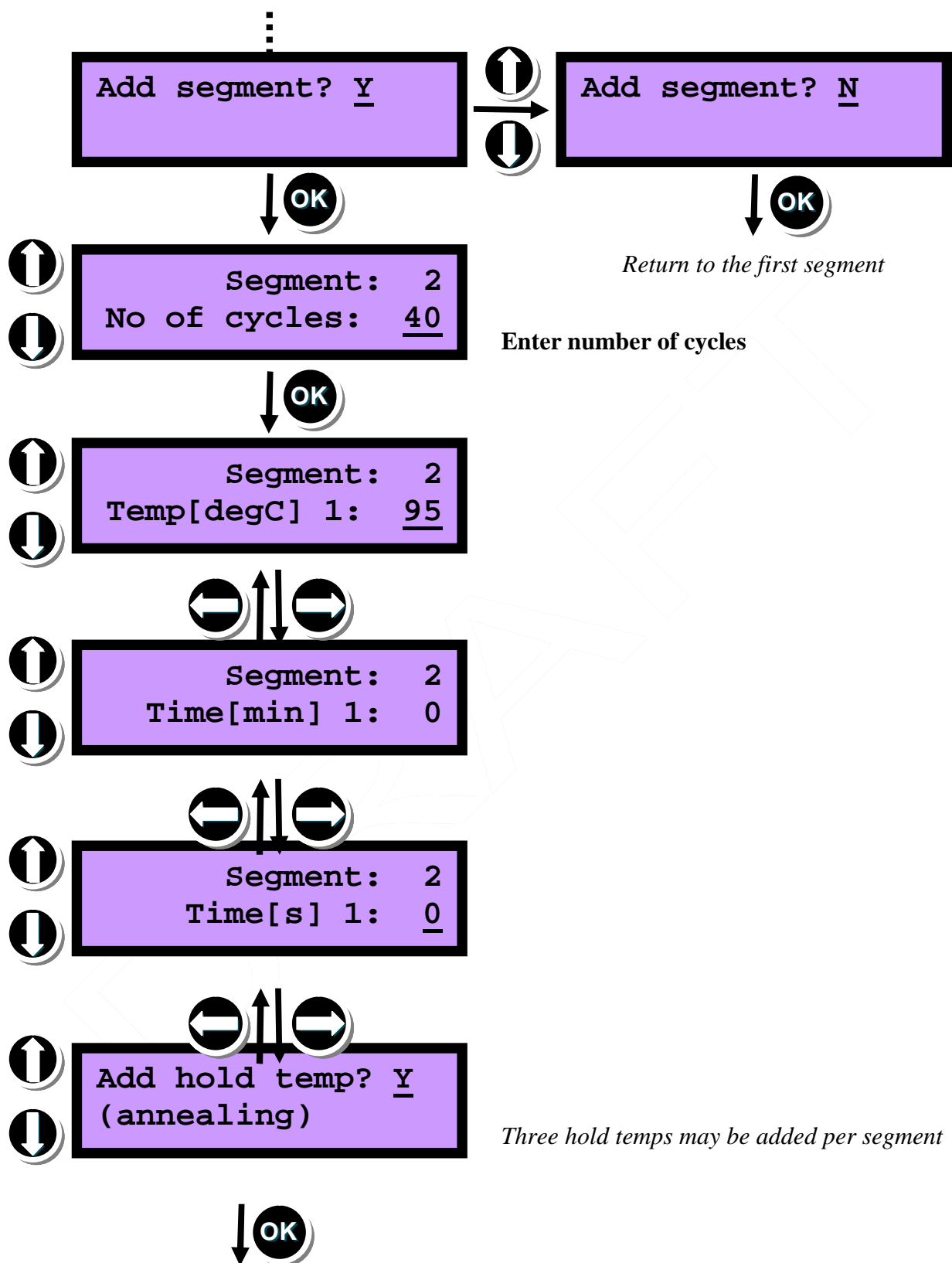
A total of more than 100 programs may be stored in AmpXpress. Programs are created either using the control buttons or, optionally, using an external PC and the AmpX software (see section 4).

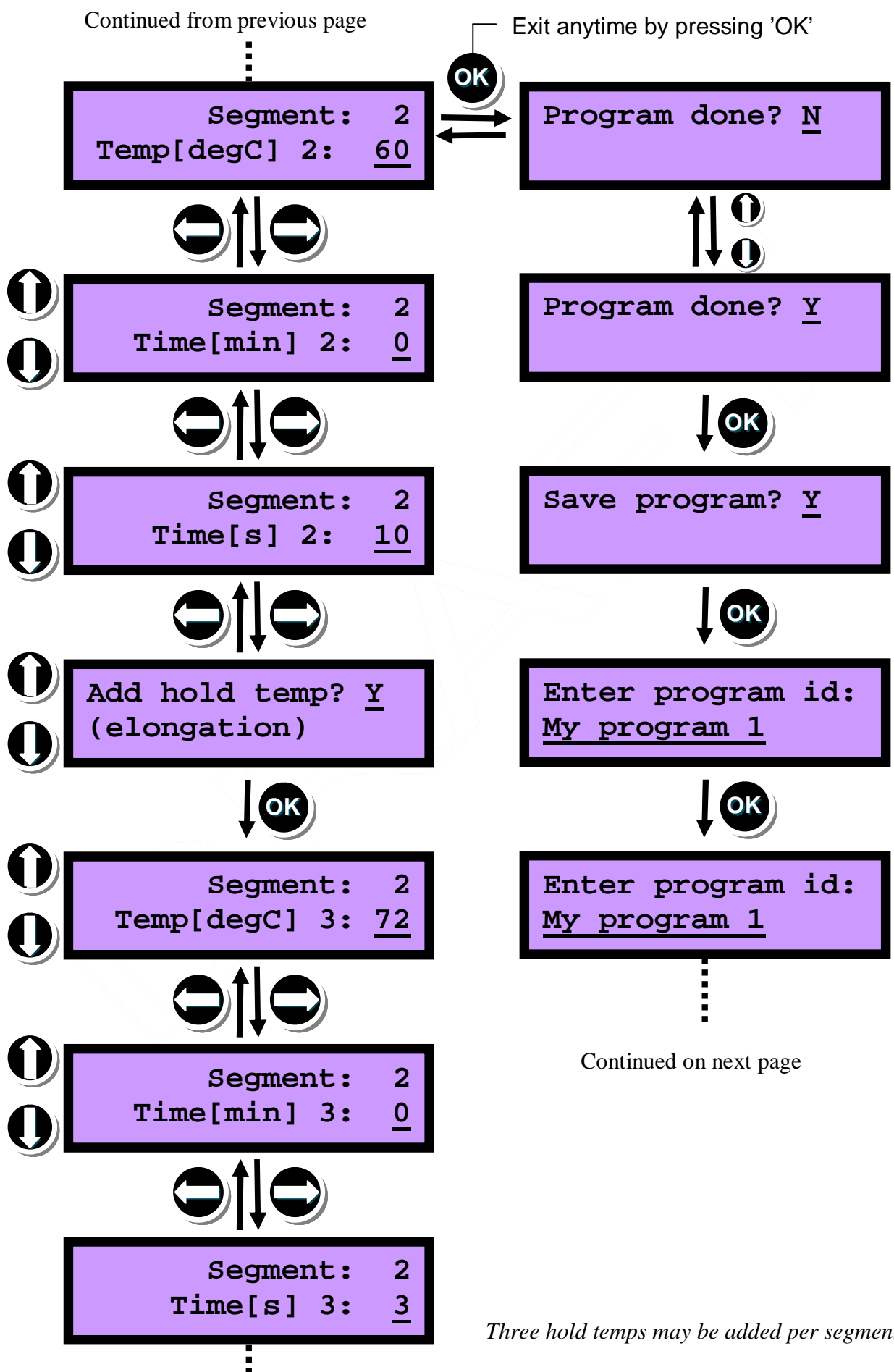
The 'Create program' function is used for *creating* programs (i.e. to define temperature and time settings) using the control buttons. Press 'OK' to enter the 'Create program' menu. Then use the 'up' and 'down' arrows to define settings. Use the 'right' arrow to proceed to the next step.

The initial segment allows for two different hold temperatures ('2-step start segment') suited for e.g. RT-PCR or whenever more than one initial hold temperature is utilized. The subsequent segments are preprogrammed for up to three hold temperatures ('denaturation', 'annealing', and 'elongation').



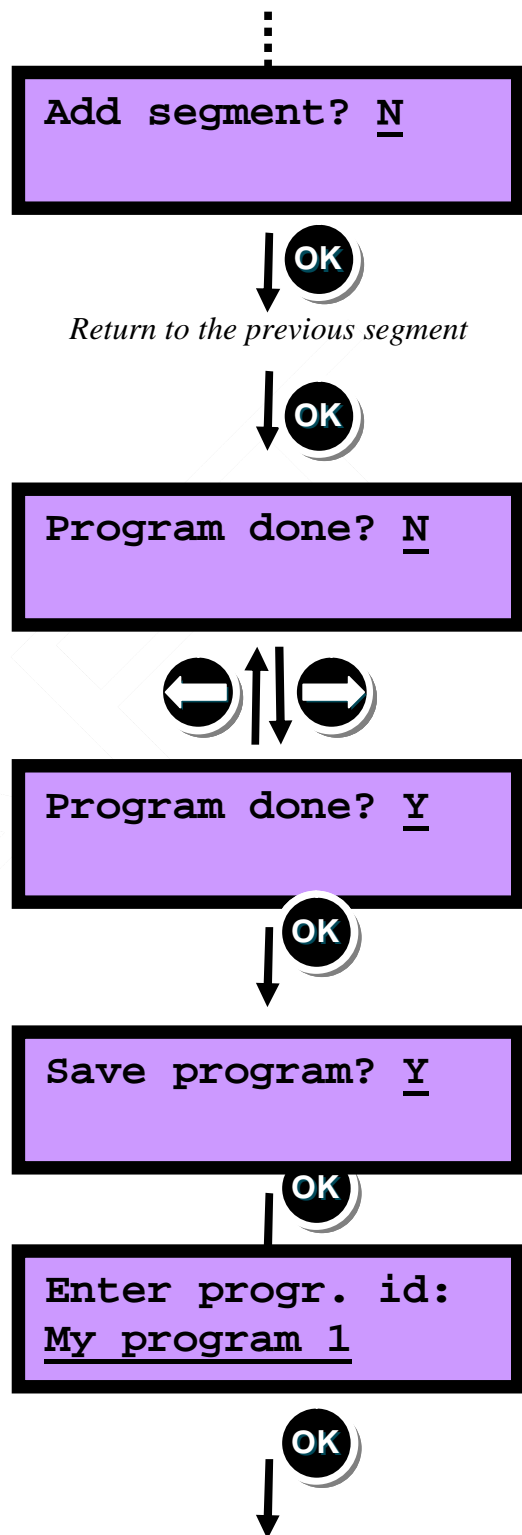
Continued from previous page





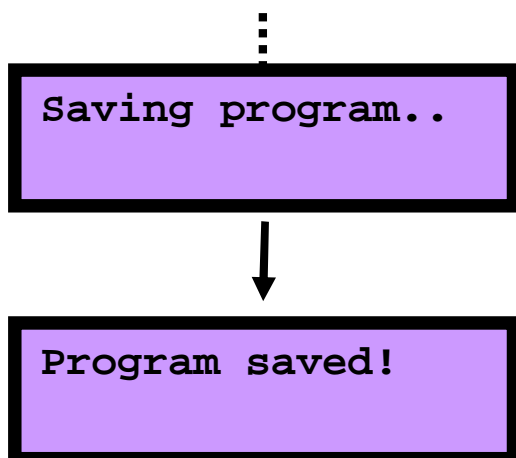
Continued from previous page

Press 'OK' again to finish the program




Use 'up' and 'down' arrows to toggle between different letters and numbers. Then use the 'right' arrow to add more characters. Press 'OK' to finalize the program name.

Continued from previous page



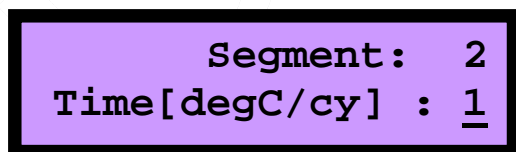
3.10.1 Deletion of Segments

Segments can be deleted by pressing the  key from the first position of the segment. The following option is then presented:



3.10.2 Touch down PCR

To program a touch-down PCR enter the number of cycles for the touch-down. Use one segment for the touch-down settings and a separate segment for the subsequent cycles. First, enter the number of cycles for the touch down. Then, enter the desired number of degrees/per cycle, see below. Touch-down only allows for annealing down to 40°C. If the touch-down settings result in a final annealing temp below 40°C the following error message appears "TD gives a final temp below 40".



4. AMPX SOFTWARE MANUAL

4.1 INTRODUCTION

This manual is written for AmpX software version 2.0.

4.1.1 Definitions

Term	Explanation
Main window	The 'main window' is defined as the window that includes the temperature sequence setup. This is the window that appears when the AmpX application is started.

4.1.2 Operative system

The application works with the following operative system:

Microsoft Windows XP Professional (32-bit), Service Pack 3.
Microsoft Windows 7 (32-bit and 64-bit)

Please use the regional setting 'English (United States)' as language in Windows 'regional options'.

4.1.3 Install / Uninstall AmpX software

AmpX software installation is normally started automatically when the installation disc is inserted in the CD/DVD-drive. Please refer to the "readme.txt" file on the installation disc for additional information on installation procedures and last minutes changes before you start the installation procedure.

4.2 START THE AMPX SOFTWARE

Open the application from the Windows 'Start' menu / 'All Programs' / 'AlphaHelix' / 'AmpX 2.0' or double click on the ampX icon on your windows desktop.

4.2.1 Main window

AmpX software starts with an empty program file. The first window presented to the user is the 'main window' (Figure 18).

The main window comprises: Menu bar, Temperature Sequence window, Program button, Segment panel, Segment control, Segment temperature window and segment choice.

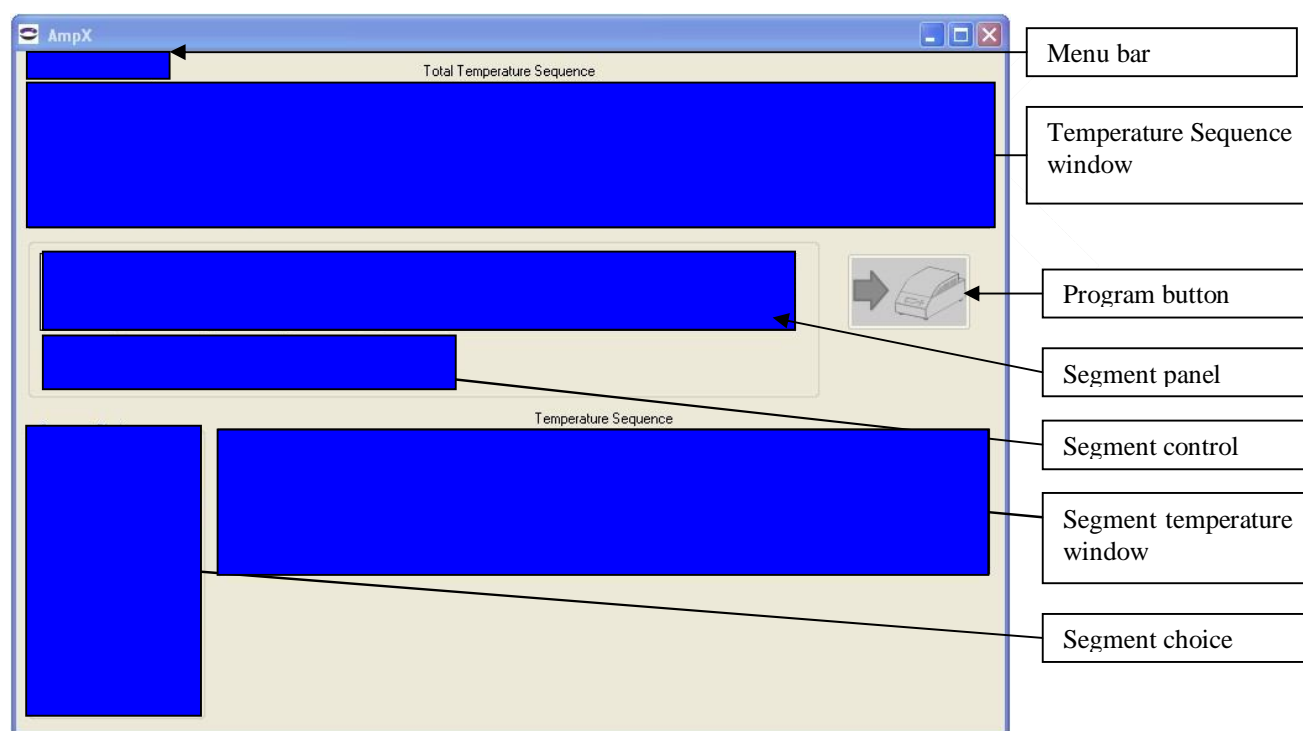


Figure 18 AmpX 'main window'

4.2.1.1 Menu bar

The menu bar access actions to save and open program files with temperature sequences you have created in AmpX software. Opening the program automatically open a new file and you can start creating your temperature sequence right away. The Tools menu is used to customize your segment pre-settings and working directory as well as setting USB options.

4.2.1.2 Temperature sequence window

The temperature sequence window shows the total temperature sequence based on the information in each segment located in the segment panel. Note the difference compared to the segment temperature window.

4.2.1.3 Segment Temperature window

The segment temperature window only shows the temperature profile for the selected segment in the segment panel.

4.2.1.4 Segment panel

The segment panel show the order of segments used to build the temperature sequence. When empty, it can only be populated with the highlighted segments in the segment choice panel. When populated, buttons in the segment choice and segment control will be highlighted to show possible actions for the populated segments in the segment panel.

4.2.1.5 Segment control

The buttons in segment control panel is used to change, move or delete the highlighted segment in the segment panel.

4.2.1.6 Segment choice

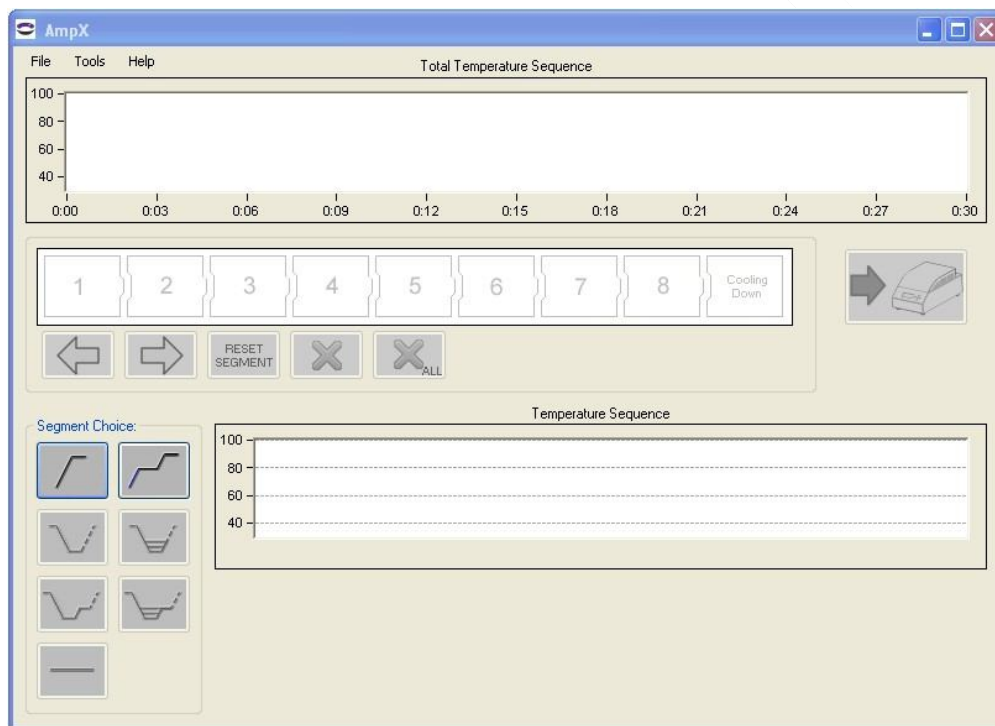
The buttons in the segment choice panel is used to put the corresponding buttons segment in the segment in the segment panel. By left clicking on the highlighted button the segment will be put in the segment panel with pre-set values. An additional set of parameters for the selected segment is displayed below the Segment temperature window. The parameters can be changed directly in the parameter field and the changes are displayed both in the Temperature Sequence window and Segment temperature window. By selecting a new segment the values in the previous segment are stored as displayed on the screen.

4.2.1.7 Program button

The Program button is used to down load the temperature sequence in AmpX software to AmpXpress. Make sure that the USB cable is connected between the computer and AmpXpress before the program button is pressed. Also, AmpXpress must be set in Load program mode before it can retrieve the program from AmpX software. Please refer to “3.5 Load Program” for an explanation on the topic.

4.2.2 Creating a Temperature sequence

This section will guide you through a temperature sequence setup, step by step.
Start AmpX software on your computer. Your AmpX software screen should look as below.




1. Left click segment choice button (One step start)



2. Left click segment choice button (Three step cycle)



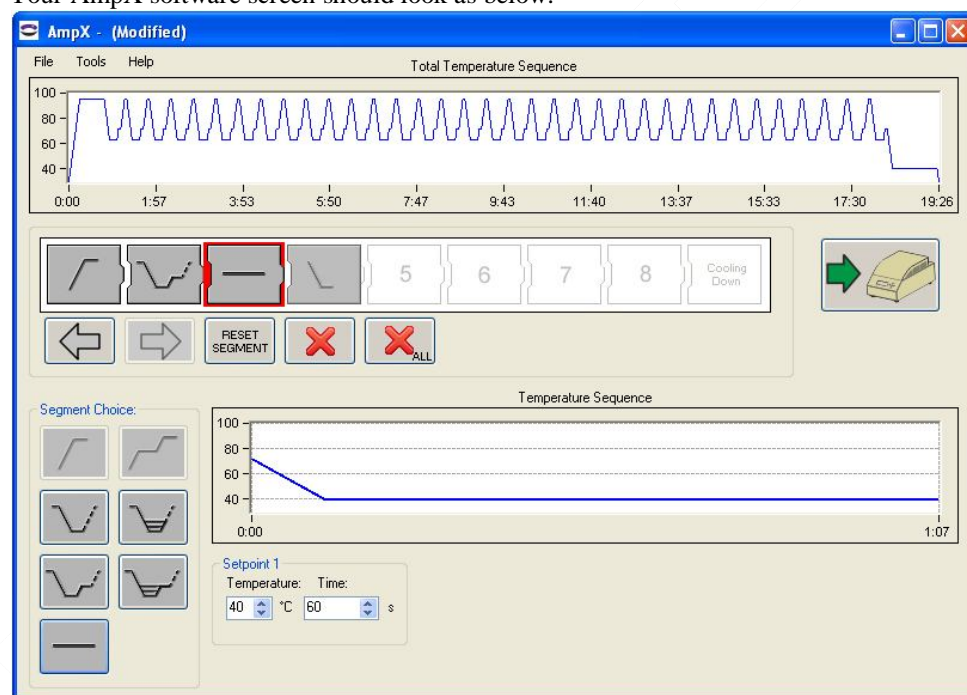
5. Left click the number of cycles and change 35 to 30 by using down arrow or entering the number with the keyboard.

6. Hoover your mouse icon over the Isothermal step button  without pressing the button. A label will appear after a few seconds with an explanation of the segment function. Also, note there is a space between the three step segment and end segment indicating that the segment will be inserted on position 3 in the segment panel. See figure below.



7. Left click segment choice button (Isothermal step). The segment will be added to the right of the three step segment.


Your AmpX software screen should look as below:





Note that the last segment added has a red ring around the icon in the segment panel. This is the active segment.

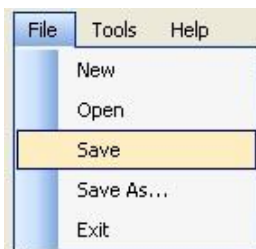
The active segment can be edited in the set point field and changes will be updated directly in the graphical fields (Total Temperature sequence and Temperature sequence).

To change active segment and edit Set point values Right click the segment in the segment panel.

If you want to move the active segment in the segment panel press the Move button  in the segment control panel. Depending on the segment properties and position in the segment panel move buttons will be inactive.

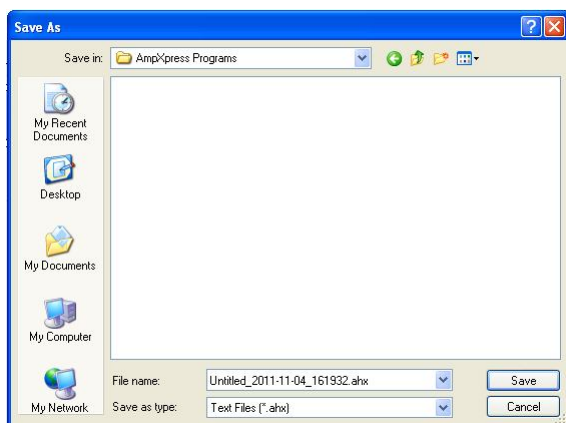
A temperature sequence always starts with 'One step start'  or 'Two step start'  segments. These segments will always be located on the first position in the segment panel and cannot be moved from this position.

8. Left click File Menu and select save.



AmpX software suggests the file name Untitled_2011-11-04_161932.ahx since this is a new program not saved before. You can change the name and location by using standard Windows functionality.

Remember: The name you select will be the file name also in AmpXpress run program menu when transferring the sequence file to the instrument.

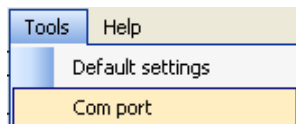


The program is now ready to be transferred to AmpXpress instrument via the USB interface.

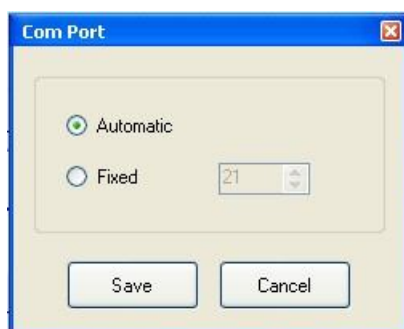
4.3 LOADING A TEMPERATURE SEQUENCE

The 'Program' button, located on the right side of the window (Figure 19), is used to transfer the temperature sequence (program) to the instrument. The instrument must be in the correct mode before this button is clicked (see section 3.5 'Load Program'), otherwise the temperature sequence will not be received by AmpXpress. The temperature sequence is saved in the instrument library with the same filename as the file on the external PC.

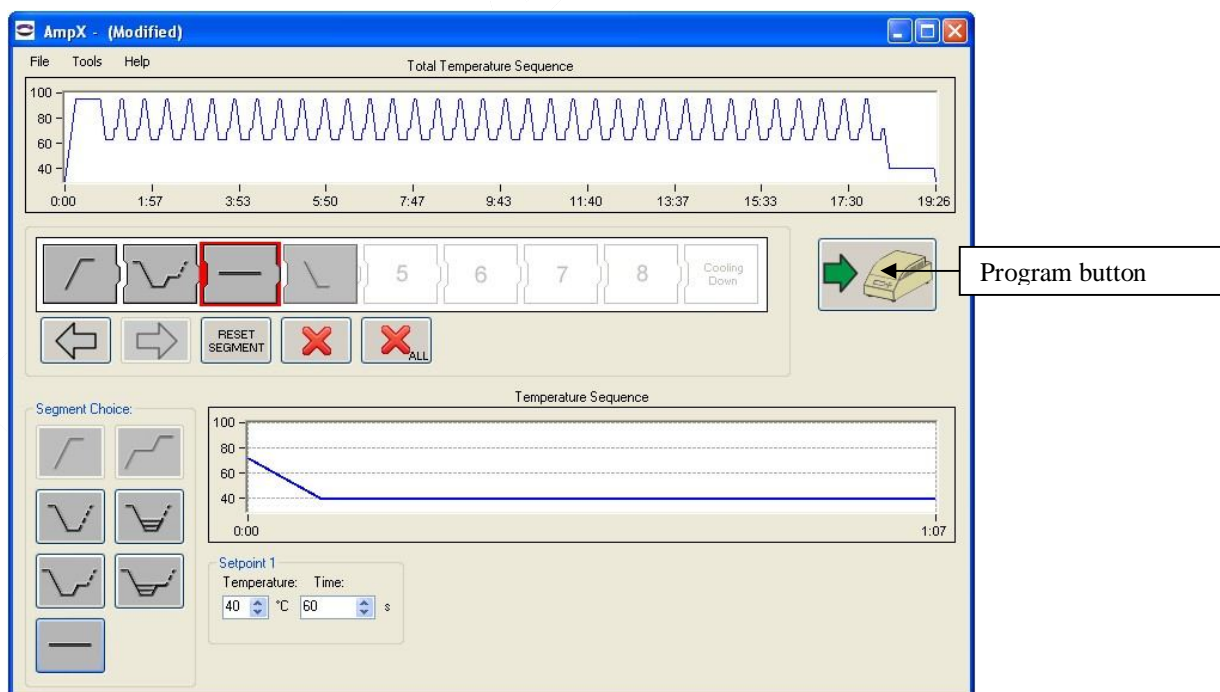
1. Connect the enclosed USB cable between AmpXpress and the computer with AmpX installed.
2. Set the instrument in Load Program mode (See 3.5 LOAD PROGRAM)
3. Select 'Tools' menu and 'Com Port'.



4. Select radio button Automatic and left click 'Save' -button.



5. Left click Program button. The instrument will display "Load succeeded" when the program is loaded.



4.4 Detailed function description

4.4.1 Segment description

Segment buttons are located in the 'Segment choice' panel. Once left clicked the segment symbol will appear in the segment panel. The order of segment in the segment panel will give the final temperature sequence.



Figure 19 Segment Panel

4.4.1.1 'One Step Start' –segment



Suggested usage: First denaturation step in the temperature profile.
Position in 'segment panel': First position only

Setpoint 1

Temperature: 40 to 98 °C
Time: 0 to 5999 seconds

4.4.1.2 'Two Step Start' –segment



Suggested usage: Reverse transcriptase (RT) with a RT step followed by denaturation step.
Position in 'segment panel': First position only

Setpoint 1

Temperature: 40 to 98 °C
Time: 0 to 5999 seconds

Setpoint 2

Temperature: 40 to 98 °C
Time: 0 to 5999 seconds

Note: Always use *setpoint 2* with a higher temperature value than *setpoint 1* for correct function.

4.4.1.3 'Two Step Cycle' –segment



Suggested usage: Two step cycle sequencing.

Position in 'segment panel': Position 2 to 8

Setpoint 1		Setpoint 2		Number of cycles:
Temperature:	Time:	Temperature:	Time:	
95 °C	0 s	60 °C	20 s	40

Setpoint 1

Temperature: 40 to 98 °C

Time: 0 to 5999 seconds

Setpoint 2

Temperature: 40 to 98 °C

Time: 0 to 5999 seconds

Number of cycles: 2 to 99

Note: Always use *setpoint 2* with a higher temperature value than *setpoint 1* for correct function.

4.4.1.4 'Three Step Cycle' –segment



Suggested usage: Three step cycle sequencing.

Position in 'segment panel': Position 2 to 8

Setpoint 1 (Denaturation)		Setpoint 2 (Annealing)		Setpoint 3 (Extension)		Number of cycles:
Temperature:	Time:	Temperature:	Time:	Temperature:	Time:	
95 °C	3 s	63 °C	10 s	72 °C	3 s	35

Setpoint 1

Temperature: 40 to 98 °C

Time: 0 to 5999 seconds

Setpoint 2

Temperature: 40 to 98 °C

Time: 0 to 5999 seconds

Setpoint 3

Temperature: 40 to 98 °C

Time: 0 to 5999 seconds

Number of cycles: 2 to 99

Note: Always use *setpoint 2* with a higher temperature value than *setpoint 1* for correct function.

Always use *setpoint 3* with a higher temperature value than *setpoint 2* for correct function.



4.4.1.5 'Two Step Cycle' –segment

Suggested usage: Two step cycle sequencing with touch down temperature.

Position in 'segment panel': Position 2 to 8

Setpoint 1 Temperature: 98 °C Time: 3 s		Setpoint 2 Temperature: 70 °C Time: 10 s		Number of cycles: 31
Touch Down: 1 °C/cycle				

Setpoint 1

Temperature: 40 to 98 °C

Time: 0 to 5999 seconds

Setpoint 2

Temperature: 41 to 98 °C

Time: 0 to 5999 seconds

Touch Down: 1 to 9 °C /cycle

Number of cycles: 2 to 99

Note: Always use *setpoint 2* with a higher temperature value than *setpoint 1* for correct function.



4.4.1.6 'Three Step Cycle' –segment

Suggested usage: Three step cycle sequencing with touch down temperature.

Position in 'segment panel': Position 2 to 8

Setpoint 1 (Denaturation) Temperature: 95 °C Time: 3 s		Setpoint 2 (Annealing) Temperature: 65 °C Time: 10 s		Setpoint 3 (Extension) Temperature: 72 °C Time: 3 s		Number of cycles: 2
Touch Down: 1 °C/cycle						

Setpoint 1

Temperature: 40 to 98 °C

Time: 0 to 5999 seconds

Setpoint 2

Temperature: 40 to 98 °C

Time: 0 to 5999 seconds

Touch Down: 1 to 9 °C /cycle

Setpoint 3

Temperature: 40 to 98 °C

Time: 0 to 5999 seconds

Number of cycles: 2 to 99

Note: Always use *setpoint 2* with a higher temperature value than *setpoint 1* for correct function.

Always use *setpoint 3* with a higher temperature value than *setpoint 2* for correct function.

4.4.1.7 'Isothermal step'–segment

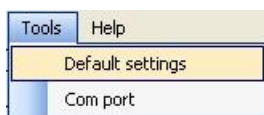


Suggested usage: Isothermal step to finalize extension
Position in 'segment panel': Position 2 to 8

Setpoint 1
Temperature: 40 to 98 °C
Time: 0 to 5999 seconds

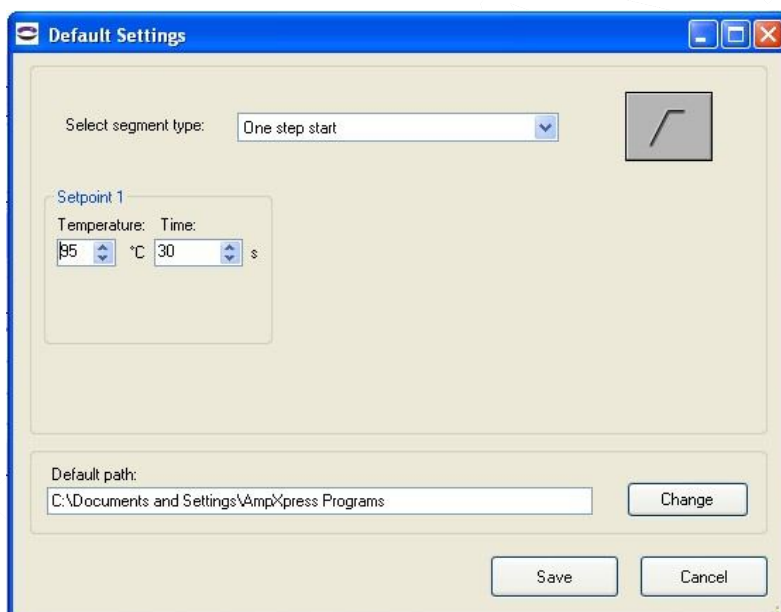
4.4.2 Tools menu

4.4.2.1 Segment pre-settings



All segment buttons are pre set with values to facilitate fast method set-up. Pre-settings for the segment buttons can be altered under the 'Tools' menu by selecting 'default settings'.

Left clicking 'Default settings' will bring up the below window.

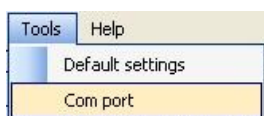


By choosing a segment from 'Select segment type' drop down list set point values can be edited and saved by left clicking the 'Save'-button. The setting you have altered will now be displayed as pre-setting every time you select that segment in the 'Segment choice' panel.

4.4.2.2 Default path.

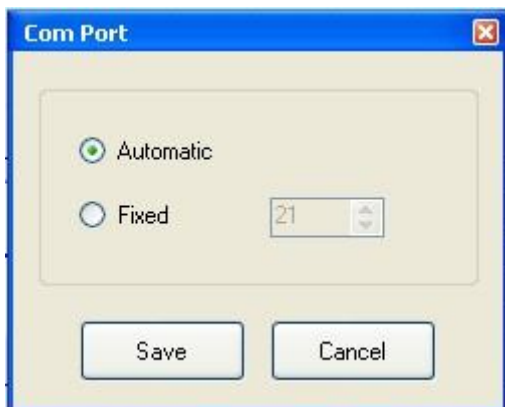
If you save all your temperature sequence files on a specific library, a default path can be set for the program to open this folder as pre-set library to save your program files.

4.4.2.3 Com port



Com port options for connection to AmpXpress are available under the 'Tools' menu by selecting 'Com port'.

Select 'Com port' in the tools menu to bring up the below window.



Select option 'Automatic' to have AmpX program automatically searching for a connected AmpXpress instrument. This is default option and recommended setting.

Select option 'Fixed' to force AmpX program to connect to the instrument at the specified COM port.

4.4.3 File menu



4.4.3.1 New

Creates a new temperature sequence file. If the existing file is modified, the program will prompt the user to save current work prior to opening the new file. The new file will automatically get the file name 'Untitled_Year_Mounth_day_time.ahx'. (Example: Untitled_2011-11-08_101040.)

4.4.3.2 Open

Allow the user to open an existing temperature sequence file on the computer.

Note: It is not possible to open a temperature sequence file stored on the instrument via AmpX software.

4.4.3.3 Save

Save the temperature sequence file, currently in use, directly with the given name.

If the existing file has been altered, without giving a new file name, the program will bring up the 'Save as' dialogue box. This behavior is to prevent accidental overwriting of a temperature sequence file.

4.4.3.4 Save As

Save as bring up the dialogue box. 'Save as' with the previously saved name or by the software suggested name.

4.4.3.5 Exit

Exit the program and any unsaved work is prompted to be saved.

5 QUESTIONS AND ANSWERS

5.1 PROBLEMS AND QUESTIONS RELATED TO THE OPERATION OF THE INSTRUMENT.

Q: How can I tell if the temperature probe is OK?

A: The following criteria must be met to ensure proper function of the probe (and AmpXpress).

- i. Both sensors must be submerged in the liquid and centered in the tube to avoid contact with the walls (see Figure 1).
- ii. The connecting socket should slide onto the connecting pins of the rotor without difficulty.

Q: How can I tell if the liquid volume of the temperature probe is correct?

A: Check the volume of the temperature probe using the water level measuring stick ().

Alternatively, keep track of the weight of the temperature probe, after filling it with the correct volume of distilled water, by measuring it on scale.

It is recommended to check the amount of liquid of the probe tube before each run. If the water level is low, refill the probe using distilled or de-mineralized water (see 2.5.1). **Handle the probe very gently when opening and closing to avoid damage to the gold-plated thermistors.**

Q: The total run time of my PCR was shorter compared to what it usually is and there was less product when I analyzed the PCR reactions on a gel.

A: Make sure that the gold plated thermistors are centered in the tube and have not become bent. If the thermistors are bent so that they are touching the inside of the plastic tube, temperature regulation will not work properly. Realign the thermistors very gently using gloved hands.

Q: When I try to start the instrument I get an error message saying “Terminated! No temperature data”. What is wrong?

A: It may result from poor contact between the electrical contact surfaces underneath the rotor and the carbon pins that supply the rotor with electricity. Clean the electrical contact surfaces underneath the rotor using a damp cloth (Figure 15); and make sure the carbon pins are moving freely. Then try again. Call for service if the problem persists.

Q: Judging by the sound coming from AmpXpress I get the impression that the rotational speed is not constant. Is there something wrong?

A: No, this is perfectly normal. AmpXpress runs at a variable rotational speed between 4000 to 7000 rpm, where the higher speed is used during cooling.

5.2 PROBLEMS AND QUESTIONS RELATED TO THE OPERATION OF AmpX Software.

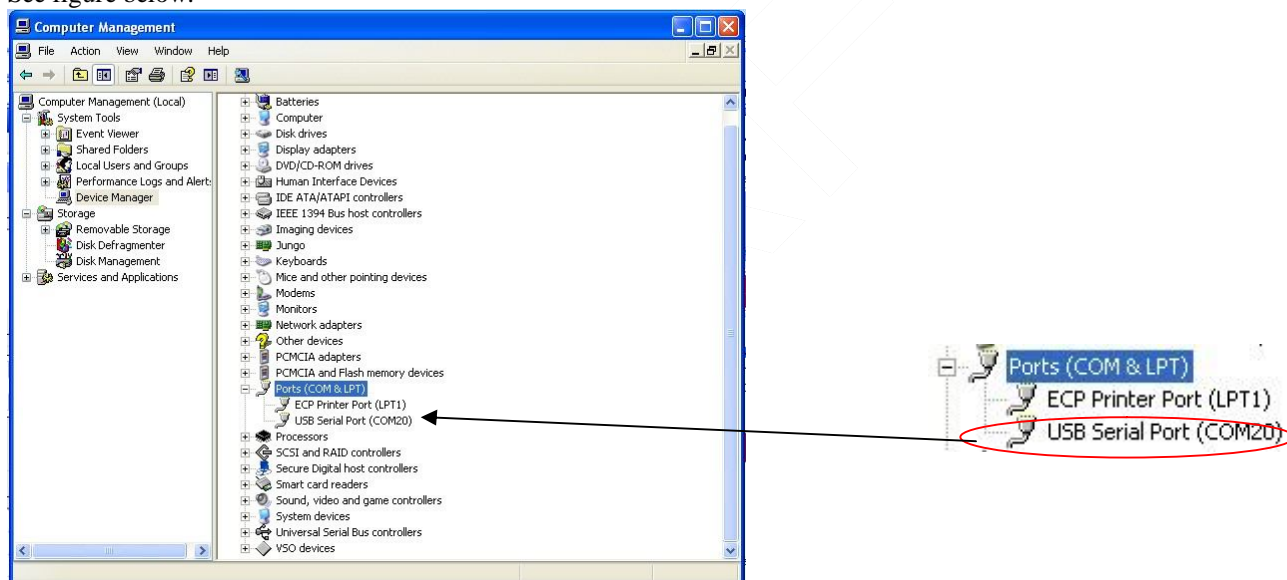
Q: I get the following message when I try to load a temperature sequence to the instrument



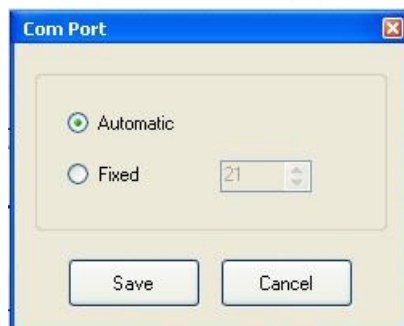
A: Make sure the instrument is in 'Load program' mode. Note that the instrument will exit the mode after 1 minute if no program has been sent!

If the USB cable is connected and the instrument is in 'Load Program' mode there might be a problem with the USB to Serial windows driver.

Check that the USB to Serial connection is identified by Microsoft Windows in the Device Manager. Check that there is a 'USB Serial port COM(port number)' connection under 'Ports (COM & LPT)' See figure below.



Make sure that the COM number has the same number as the Fixed Com Port setting in the 'Tools' \ 'Com Port' setting, or, 'Automatic' option is used.



Note:

(Windows enumerates a new COM port number to the USB port if another USB connector, than used before, is connected to the instrument. Therefore, it is strongly recommended to use the Automatic option under the 'Tools' \ 'Com port' setting.)

Try to reinstall the enclosed USB to Serial driver. For more information please refer to the readme.txt file on the Installation CD-ROM.

6. ERROR MESSAGES

In case a software or hardware error occurs, an error message is presented on the front display and the buzzer will sound. Errors messages and what action to take is explained in the table below.

6.1 ERROR MESSAGE DURING OPERATION

Message presented on AmpXpress front panel	Explanation	Action to take
Aborted by user	Program aborted during run, by the user	Press 'OK' to return to main menu.
Bluetooth error	Bluetooth communication error	Turn the instrument OFF and then ON again (unplug power cord). Call for service if the problem persists.
Incorr. set temp	Temperature setting is out of range	Correct temperature setting.
Int. error #nnnn (see table above)	Various internal errors	Turn the instrument OFF and then ON again (unplug power cord). Call for service if the problem persists
Lid is open	The outer lid is open	Close the lid.
Lid not locked	The outer lid is not locked	Open and close the lid. Press the lid downwards to lock it.
No RPM data	Rotation (speed) data from the centrifuge is lost	Turn the instrument OFF and then ON again (unplug power cord). Call for service if the problem persists.
No temp data FRO	Probe data is frozen, i.e. not changing with time	Turn the instrument OFF and then ON again (unplug power cord). Make sure that the temperature probe is properly positioned. Replace the temperature probe if the problem persists.
No temp data TMO	Probe data timeout	Clean the electrical contact surfaces underneath the rotor (Figure 15). Inspect carbon pins and make sure they are not stuck. Replace the temperature probe if the problem persists.
No temp data CON	Probe data is not available because there is no connection with the rotor	Inspect carbon pins to see if they are stuck. Make sure the rotor is correctly positioned.
No temp data COM	Probe data cyclic redundancy check (CRC) error	Make sure that the temperature probe is properly positioned. Replace the probe if the problem persists.
Probe error	Probe error; faulty probe	Replace the temperature probe.
Probe overtemp	Probe is too hot. Temperature >99°C.	Inspect probe thermistor. Make sure thermistors are not in contact with tube wall.
Prog bad index Prog bad descr Program bad data Bad checksum	Various program checks	Turn the instrument OFF and then ON again (unplug power cord). Delete the program. Re-program and make sure the program settings are properly entered.
Program error	A critical program error has occurred	Turn the instrument OFF and then ON again (unplug power cord).
RAM memory low	Not enough RAM memory left	Turn the instrument OFF and then ON again (unplug power cord). Call for service if the problem persists.

Ramping too slow	Temperature ramping is too slow	Check the water level of the temperature probe. Make sure the IR radiator wire is not broken. Call for service if the problem persists.
Reflect overtemp	Reflector temperature is too high	Make sure the ambient temp is within specifications (below 40°C); and that 'Ambient overtemp continue' is turned 'OFF' (see 3.8.4).
Room T too high	Ambient temperature is too high	Move the instrument to a colder environment
Rotor crash	Accelerometer crash detected	Inspect the rotor for any damage. Make sure the rotor locking screw is securely attached.
Rotor imbalance	Accelerometer excessive movement detected	Check that the rotor is properly positioned and correctly balanced with tubes.
Rotor power err	No rotor power	Clean the electrical contact surfaces underneath the rotor (Figure 15).
RPM out of range	Centrifuge motor speed (rpm) out of range	Call your local dealer of AlphaHelix for service.
Temp data lost	Corrupt temperature probe data	Make sure that the temperature probe is properly positioned. Replace the probe if the problem persists.
Terminated! No rotor data	There is no power to the rotor	Inspect carbon pins and make sure they are not stuck. Clean the electrical contact surfaces underneath the rotor (Figure 15). Call for service if the problem persists.
Terminated! Probe error	No probe is sitting in the rotor	Insert a temperature into the rotor
Terminated! Lid was opened	The lid was opened after a program was started	Open and close the lid properly
Undefined error	Others unhandled errors	Turn the instrument OFF and then ON again (unplug power cord). Call for service if the problem persists

7 GENERAL INFORMATION

7.1 DECLARATION OF CONFORMITY

AmpXpress meets the requirements of the following directives and standards:

7.1.1 European directives

AmpXpress has CE-mark and complies with the requirements of Low Voltage Directive, 73/23/EEC. It also complies with the EMC directive, 89/336/EEC including amendments by the CE marking directive 93/68/EEC.

AmpXpress has been tested and complies with the requirements of: EN 61010-1:2001, EN 61010-2-020:1994 and A1 (Exclusive part 7 and 13), EN 61326-1:2006, EN 61326-2-6:2006. EN 301 489-1 V1.6.1 (2005-09) and EN 301 489-17 V1.3.1

AmpXpress complies with the requirements of:

- WEE 2002/96/EC
- ROHS 2002/95/EC

7.1.2 UL and CSA directives

AmpXpress complies with the requirements of UL 61010-1, second edition, 2004 and CAN/CSA C22.2 NO. 61010-1

7.2 WEEE COMPLIANCE STATEMENT



7.3 VALID FOR CUSTOMERS IN EU COUNTRIES

We are committed to be a good corporate citizen. As part of that commitment, we strive to maintain an environmentally conscious manufacturing operation. The European Union (EU) has enacted a directive on product recycling (Waste Electrical and Electronic Equipment, WEEE) and over time this directive will be implemented in the national laws of each EU member state.

Products falling under the scope of the WEEE directive will be identified with a crossed over “Wheelie bin” symbol on the product label, as indicated above. To forward the products to recycling or proper disposal, use an authorized collection system or return the products to AlphaHelix Molecular Diagnostics AB.

7.4 CONTACT INFORMATION

For help or questions please contact your local dealer, or AlphaHelix directly at:

AlphaHelix Molecular Diagnostics AB

Kungsängsvägen 29

SE-753 23 Uppsala

Sweden

Phone: +46 18 120701

E-mail: info@alphahelix.com

www.alphahelix.com

To place an order contact your local distributor, or AlphaHelix at: sales@alphahelix.com